RR Donnelley & Sons Co
Form 10-K
February 27, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018
OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to
Commission file number 1-4694

R. R. DONNELLEY & SONS COMPANY

(Exact name of registrant as specified in its charter)

Delaware	36-1004130
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
35 West Wacker Drive, Chicago, Illinois	60601
(Address of principal executive offices)	(ZIP Code)

Registrant’s telephone number, including area code—(312) 326-8000

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 $0.01)	New York Stock Exchange

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§229.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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

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

If an emerging growth company, indicate by check mark if the registrant has elected to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

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

The aggregate market value of the shares of registrant's common stock held by non-affiliates based on the sale price of the common stock on June 30, 2018 was $395,032,904.

As of February 22, 2019, 70,444,352 shares of common stock were outstanding.

Documents Incorporated By Reference

Portions of the registrant's proxy statement related to its annual meeting of stockholders scheduled to be held on May 16, 2019 are incorporated by reference into Part III of this Form 10-K.

TABLE OF CONTENTS

	Form 10-K Item No.	Name of Item	Page
Part I			
	Item 1.	Business	3
	Item 1A.	Risk Factors	9
	Item 1B.	Unresolved Staff Comments	17
	Item 2.	Properties	17
	Item 3.	Legal Proceedings	17
	Item 4.	Mine Safety Disclosures	17
		Executive Officers of R.R. Donnelley & Sons Company	18
Part II			
	Item 5.	Market for R.R. Donnelley & Sons Company's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities	19
	Item 6.	Selected Financial Data	20
	Item 7.	Management's Discussion and Analysis of Financial Condition and Results of Operations	21
	Item 7A.	Quantitative and Qualitative Disclosures about Market Risk	39

	Item 8.	Financial Statements and Supplementary Data	39
	Item 9.	Changes in and Disagreements with Accountants on Accounting and Financial Disclosure	39
	Item 9A.	Controls and Procedures	39
	Item 9B.	Other Information	42
Part III			
	Item 10.	Directors and Executive Officers of R.R. Donnelley & Sons Company and Corporate Governance	42
	Item 11.	Executive Compensation	42
	Item 12.	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters	42
	Item 13.	Certain Relationships and Related Transactions, and Director Independence	43
	Item 14.	Principal Accounting Fees and Services	43
Part IV			
	Item 15.		43

	Exhibits, Financial Statement Schedules	
Item 16.	Form 10-K Summary	43
	Signatures	48

PART I

ITEM 1. BUSINESS

Company Overview

R.R. Donnelley & Sons Company ("RRD," the "Company," "we," "us," and "our"), a Delaware corporation, helps organizations communicate more effectively by working to create, manage, produce, distribute and process content on behalf of our clients. We assist clients in developing and executing multichannel communication strategies that engage audiences, reduce costs, drive revenues and enhance compliance. Our innovative content management offering, production platform, logistics services, supply chain management, outsourcing capabilities and customized consultative expertise assists our clients in the delivery of integrated messages across multiple media to highly targeted audiences at optimal times to their customers in virtually every private and public sector. We have strategically located operations that provide local service and responsiveness while leveraging the economic, geographic and technological advantages of a global organization.

Competitive Strategy

Our key strategic focus areas, which leverage our long-standing client relationships and comprehensive portfolio of capabilities, are as follows:

- Driving Profitable Growth: We intend to drive profitable growth in each of our core businesses.
- Extending our Capabilities: We intend to extend the range of our capabilities, products and service offerings to fuel organic growth from our global client base.
- Expanding Print and Digital Technology Platforms: We intend to continue expanding our print and digital technology platforms, with innovative content management, data analytics, and multichannel capabilities for targeted markets.
- Disciplined Capital Allocation: We intend to maintain a disciplined approach to capital allocation with an added focus on reducing our leverage, while also pursuing strategic acquisitions and business partnerships that will further enhance our digital technology, workflows and print capabilities.
- Optimizing Business Performance: We intend to optimize our business performance by focusing on service quality and operational excellence.

Segment Descriptions

Our reportable segments and their product and service offerings are summarized below.

Business Services

Our Business Services segment provides customized solutions at scale to help clients inform, service and transact with their customers. The segment's primary product and service offerings include commercial print, logistics, statement printing, labels, packaging, supply chain management, forms and business process outsourcing. This segment also includes all of our operations in Asia, Europe, Canada and Latin America. In 2018, our Business Services segment accounted for 82.6% of our consolidated net sales.

Commercial Print

We provide various commercial printing products and offer a full range of branded materials including manuals, publications, brochures, business cards, flyers, post cards, posters and promotional items. Commercial print accounted

for 34.4% of our Business Services segment’s net sales for the fiscal year ended December 31, 2018.

Logistics

We provide specialized transportation and distribution services using our third party logistics solutions. These services are comprised of freight services, including truckload, less-than-truckload, intermodal and international freight forwarding; international mail and parcel distribution; and courier services including same day and next day delivery. As discussed in Note 3, Dispositions and Acquisition, to the Consolidated Financial Statements, we sold our Print Logistics business on July 2, 2018. Print Logistics services included the distribution of retail and newsstand printed materials. Logistics accounted for 19.7% of our Business Services segment’s net sales for the fiscal year ended December 31, 2018, which included $203.3 million or 3.6% of Business Services’ net sales, related to our former Print Logistics business.

Packaging

We provide packaging solutions, ranging from rigid boxes to in-box print materials, for clients in consumer electronics, life sciences, cosmetics and consumer packaged goods industries. Packaging accounted for 12.0% of our Business Services segment's net sales for the year ended December 31, 2018.

Statements

We create critical business communications, including customer billings, financial statements, healthcare communications and insurance documents. Our capabilities include design and composition, variable imaging, email, archival and digital mail interaction, as well as our innovative RRDigital solution set. Statements accounted for 10.4% of our Business Services segment's net sales for the fiscal year ended December 31, 2018.

Labels

We produce custom labels for clients across multiple industries including warehouse and distribution, retail, pharmaceutical, manufacturing and consumer packaging. We offer distribution and shipping labels, healthcare and durable goods labels, promotional labels and consumer product goods packaging labels. Labels accounted for 8.6% of our Business Services segment's net sales for the fiscal year ended December 31, 2018.

Supply Chain Management

We provide workflow design to assembly, configuration, kitting and fulfillment for clients in consumer electronics, telecommunications, life sciences, cosmetics, education and industrial industries. Supply chain management accounted for 5.7% of our Business Services segment's net sales for the fiscal year ended December 31, 2018.

Forms

We produce a variety of forms including invoices, order forms and business forms that support both the private and public sectors for clients in financial, government, retail, healthcare and business services industries. Forms accounted for 4.8% of our Business Services segment's net sales for the fiscal year ended December 31, 2018.

Business Process Outsourcing

We provide outsourcing services including creative services, research and analytics, financial management and other services for legal providers, insurance, telecommunications, utilities, retail and financial services companies. Business process outsourcing accounted for 4.4% of our Business Services segment's net sales for the fiscal year ended December 31, 2018.

Marketing Solutions

Our Marketing Solutions segment leverages an integrated portfolio of data analytics, creative services and multichannel execution to deliver comprehensive, end-to-end solutions. The segment's primary product and service offerings include direct marketing, in-store marketing, digital print, kitting, fulfillment, digital and creative solutions and list services. In 2018, our Marketing Solutions segment accounted for 17.4% of our consolidated net sales.

Direct Marketing

We provide audience segmentation, creative development, program testing, print production, postal optimization and performance analytics for large-scale personalized direct mail programs. Direct marketing accounted for 49.2% of our Marketing Solutions segment's net sales for the fiscal year ended December 31, 2018.

Digital Print and Fulfillment

Using digital and offset production capabilities, we provide in-store marketing materials, including signage and point-of-purchase materials, as well as custom marketing kits that require multiple types of marketing collateral. Under the trade name Motif™, we also create custom photobooks. Digital print and fulfillment accounted for 40.2% of our Marketing Solutions segment's net sales for the fiscal year ended December 31, 2018.

Digital and Creative Solutions

We help clients manage their customer data in order to better understand their customers and guide more effective marketing communications efforts. In addition, we create, edit and manage content for delivery across multiple marketing communications channels including print and digital advertising, direct marketing and mail, packaging, sales collateral, in-store marketing and social media. Digital and creative solutions accounted for 10.6% of our Marketing Solutions segment's net sales for the year ended December 31, 2018.

Corporate

Our Corporate segment consists of unallocated selling, general and administrative activities and associated expenses including, in part, executive, legal, finance, communications, certain facility costs and last-in-first-out inventory provisions. In addition, certain costs and earnings of employee benefit plans, such as pension and other postretirement benefits ("OPEB") plan expense (income) and share-based compensation, are included in Corporate and not allocated to the operating segments. Corporate also manages our cash pooling structures, which enables participating international locations to draw on our international cash resources to meet local liquidity needs.

Spinoff Transactions

On October 1, 2016, we completed the separation of our financial communications and data services business ("Donnelley Financial Solutions, Inc." or "Donnelley Financial") and our publishing and retail-centric print services and office products business ("LSC Communications, Inc." or "LSC") into two separate publicly-traded companies (the "Separation"). We completed the tax free distribution of approximately 26.2 million shares, or 80.75%, of the outstanding common stock of each of Donnelley Financial and LSC, to RRD stockholders (the "Distribution"). The Distribution was made to RRD stockholders of record as of the close of business on September 23, 2016, who received one share of Donnelley Financial common stock and one share of LSC common stock for every eight shares of RRD common stock held as of the record date. As a result of the Distribution, Donnelley Financial and LSC are independent public companies trading under the symbols "DFIN" and "LKSD", respectively, on the New York Stock Exchange. Immediately following the Distribution and as of December 31, 2016, we held approximately 6.2 million shares of Donnelley Financial common stock and approximately 6.2 million shares of LSC common stock.

In March 2017, we sold the approximately 6.2 million shares of LSC common stock retained by us and used the proceeds to repay a portion of the outstanding borrowings under our then-existing credit facility. In June 2017 and August 2017, we exchanged our approximately 6.2 million shares of Donnelley Financial common stock for certain outstanding senior indebtedness of ours, which obligations were subsequently cancelled and discharged upon delivery to us. We no longer hold any shares of the common stock of either Donnelley Financial or LSC.

The financial results of Donnelley Financial and LSC for periods prior to the Distribution are presented as discontinued operations on the Consolidated Statements of Operations and, as such, have been excluded from both continuing operations and segment results for all periods presented. Additionally, sales from RRD to Donnelley Financial and LSC previously eliminated in consolidation have been recast and are now shown as external sales of RRD within the financial results of continuing operations. See Note 2, Discontinued Operations, to the Consolidated Financial Statements for additional information.

Business Dispositions and Acquisition

On July 2, 2018, we sold our Print Logistics business within the Business Services segment.

On August 4, 2016, we acquired Precision Dialogue, a provider of email marketing, direct mail marketing and other services with operations in the United States within the Marketing Solutions segment.

During the year ended December 31, 2016, we sold five insignificant entities within the Business Services segment.

For further information on the above dispositions and acquisition, see Note 3, Dispositions and Acquisition, to the Consolidated Financial Statements.

Competitive Environment

The print and related services industry, in general, continues to have excess capacity and remains highly competitive and fragmented. Our clients operate in an evolving and ever-changing market. While the market is large and fragmented, there are tremendous changes occurring in how organizations need to create, manage, deliver and measure their communications. Some of the key factors facing our clients include regulatory changes, sensitivity to economic conditions, raw material pricing volatility and United States Postal Service ("USPS") actions. In addition, technological changes, including the electronic distribution of documents and data, online distribution and hosting of media content, and advances in digital printing, print-on-demand and internet technologies, continue to impact the market for many of our products and services.

We believe that, across our range of products and services, competition is based primarily on quality and the ability to service the special needs of clients at a competitive price. Therefore, we believe we need to continue to differentiate our product and service offerings and aggressively manage our cost structure to remain competitive. Our business is differentiated by the wide array of quality communications products and services, including print and content management, we provide for our clients. We work with our clients to create, manage, deliver and optimize their multichannel communications strategies by providing innovative solutions to meet increasing customer demands in light of the large and evolving marketplace. We also continue to develop and expand our creative and design, content management, digital and print production, supply chain management and distribution services to address our clients' evolving needs while supporting the strategic objective of becoming a leading global provider of integrated communication products and services.

Seasonality

Advertising and consumer spending trends affect demand in several of the end-markets we serve. As such, we have some seasonality in our business, mostly in the second half of the year, despite the breadth of our product and service offerings.

Raw Materials

The primary raw materials we use in our print businesses are paper and ink. We negotiate with leading suppliers to maximize our purchasing efficiencies. Some of the paper we use is supplied directly by clients. Variations in the cost and supply of certain paper grades and ink formulations used in the manufacturing process may affect our consolidated financial results. Paper prices have fluctuated over the past two years and we expect continued volatility in the foreseeable future. Generally, clients directly absorb the impact of changing prices on client-supplied paper. With respect to paper we purchase, we have historically passed most changes in price through to our clients although in many cases there is a delay based on terms within individual client contracts. We believe contractual arrangements and industry practice will support our continued ability to pass on any future paper price increases, but there is no assurance that market conditions will continue to enable us to successfully do so. We believe that the paper supply is consolidating, and there may be shortfalls in the future in supplies necessary to meet the demands of the entire marketplace. Higher paper prices and tight paper supplies may have an impact on clients' demand for printed products. We have undertaken various strategic initiatives to mitigate any foreseeable supply disruptions with respect to our paper and ink requirements.

We continue to monitor the impact of changes in the price of crude oil and other energy costs, which impact our ink suppliers, logistics operations and manufacturing costs. Crude oil, energy prices and market cost of transportation continue to be volatile. We believe our logistics operations will continue to be able to pass a substantial portion of any increases in fuel prices directly to our clients in order to offset the impact of related cost increases. Decreases in fuel prices are also passed on to clients which negatively impact sales. However, our logistics operation is restricted in its ability to pass on increased cost of transportation costs to some clients in the short term. Therefore, increases in the market cost of transportation will negatively impact income from operations. We generally cannot pass on to clients the impact of higher energy prices on our manufacturing costs. We cannot predict sudden changes in energy prices and the impact that possible future changes in energy prices might have upon either future operating costs or client demand or the related impact either will have on our consolidated annual results of operations, financial position or cash flows.

Distribution

Our products are distributed to end-users through U.S. and foreign postal services, through retail channels, electronically or by direct shipment to client facilities. In cooperation with trusted logistics vendors, we manage the

distribution of most client products we print in the U.S. and Canada to maximize efficiency and reduce costs for clients.

As a leading mail service provider of both First-Class and Marketing mail, we are ranked by the USPS as one of the largest mailers in the U.S. We work closely with our clients and the USPS to offer innovative products and mail preparation services to minimize postage costs. While we do not directly absorb the impact of higher postal rates on our clients' mailings, demand for products distributed through the U.S. or foreign postal services has been negatively impacted by increases in postal rates, as postal costs are a significant component of many clients' cost structures.

In accordance with the 2006 Postal Accountability and Enhancement Act ("PAEA"), the Postal Regulatory Commission ("PRC") adjusted and approved USPS filings for a CPI based average price increases of 1.9% to 2.0% depending on the class of mail effective January 21, 2018 and a CPI based average price increase of 2.5% on average for the Market Dominant mail classes effective January 27, 2019.

Additionally, as required on the 10-year anniversary of PAEA, the PRC initiated a comprehensive review of PAEA on December 20, 2016, to determine if the current system for regulating rates and classes for market-dominant products is still achieving the original objectives of the law. The PRC issued its findings on December 1, 2017 and concluded that the current system was not meeting all of PAEA's original objectives. To remedy this situation, the PRC proposed recommendations, which among other things, allows the Postal Service flexibility of "CPI + 2%" on market-dominant mail products for a 5-year period of time. The PRC asked for industry stakeholder input, comments and alternative suggestions to these recommendations which were due by March 1, 2018. The PRC is expected to issue additional communications regarding this 10-year review in early 2019.

In other developments, the Trump administration on April 12, 2018 issued an Executive Order establishing a Task Force ("TF") to evaluate the USPS. On December 4, 2018, the TF issued a formal report calling for a total reevaluation of the Postal Service business model to make the organization more viable and sustainable going into the future.

Clients

We have more than 50,000 clients worldwide, including 95% of the Fortune 100, 88% of the Fortune 500 and 76% of the Fortune 1000. Our products and services enable some of the world's largest companies to create, manage and deliver comprehensive and cost-effective multi-channel communications around the world. For each of the years ended December 31, 2018, 2017 and 2016, no single client accounted for 10% or more of consolidated net sales.

Technology, Research and Development

We invest in technology and research and development as a key strategy for our business. We believe that investing in new technologies allows us to remain on the forefront of content management and data analytics, while also allowing us to support our clients' growing utilization of digital and print technologies. In addition, these technologies help expand our capabilities to provide additional services to clients as customers' needs evolve. We have a research facility in Grand Island, New York, that supports the development and implementation of new technologies to meet client needs and improve operating efficiencies. We believe that proprietary technology is required where it will provide a competitive advantage or where the desired technology is not readily available in the marketplace, and as such, our proprietary technology portfolio contains an array of applications and technological capabilities which are developed to perform different functions, including digital ink jet printing. Our cost for research and development activities is not material to our consolidated annual results of operations, financial position or cash flows. In addition, while we consider our patent portfolio to be valuable, we do not believe that our business is dependent upon any single patent or group of patents. We actively monitor the registrations of our trademark and patent portfolio to ensure that our intellectual property is appropriately protected and maintained.

Cybersecurity

Our cybersecurity program is designed to meet the needs and expectations of our clients who entrust us with highly sensitive information. Furthermore, our healthcare and insurance printing businesses are subject to industry-specific data regulations, including the Health Care Insurance Portability and Accountability Act of 1996, which could subject us and our clients to liability should sensitive customer or patient information be publicly disclosed. Our infrastructure and technology, expansive and highly trained global workforce and comprehensive security and compliance program make us qualified to safely process, store and protect customer information to ensure compliance with relevant regulations.

Our infrastructure and technology security capabilities are bolstered by our relationship with a leading data center services provider. Furthermore, our networks are monitored by intrusion detection services around the clock, and our systems and applications are routinely tested for vulnerabilities and are operated under a strict patch management

program.

We employ a highly skilled IT workforce to implement our cybersecurity programs and to handle specific security responsibilities. As a result of annual mandatory security awareness training, our IT workforce is qualified to address security and compliance-related issues as they arise. Additionally, all of our IT employees are carefully screened, undergo a thorough background check and are bound by a nondisclosure agreement that details such employee's security and legal responsibilities with regard to information handling.

Environmental Compliance

It is our policy to conduct our global operations in accordance with all applicable laws, regulations and other requirements. It is not possible to quantify with certainty the impact of potential failures regarding environmental matters, particularly remediation and other compliance efforts that we may undertake in the future. However, in our opinion, compliance with the present environmental protection laws, before taking into account estimated recoveries from third parties, will not have a material adverse effect on our consolidated annual results of operations, financial position or cash flows.

Employees

As of December 31, 2018, we had 39,500 employees.

As of December 31, 2018, 416 of our U.S. employees were covered by collective bargaining agreements at ten of our U.S. facilities, representing 2.6% of our U.S. workforce. We also have collective bargaining agreements with unionized employees in China, Canada, Mexico, Brazil, Chile and Europe. We have not experienced a work stoppage during the past five years. We believe that our relationships with our employees and collective bargaining groups are good.

Available Information

We maintain an Internet website at www.rrd.com where our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and all amendments to those reports are available without charge, as soon as reasonably practicable following the time they are filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Reports, proxy and information statements and other information that is filed electronically with the SEC are available on the SEC's website at www.sec.gov.

The Principles of Corporate Governance of our Board of Directors, the Charters of the Audit, Human Resources and Corporate Responsibility & Governance Committees of the Board of Directors and our Principles of Ethical Business Conduct are also available on the Investor Relations portion of www.rrd.com, and will be provided, free of charge, to any stockholder who requests a copy. References to our website address do not constitute incorporation by reference of the information contained on the website, and the information contained on the website is not part of this document.

Forward-Looking Statements

This Annual Report on Form 10-K and any documents incorporated by reference contain forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995. These statements are subject to risks and uncertainties and are based on our beliefs and assumptions. Generally, forward-looking statements include information concerning possible or assumed future actions, events, or results of operations of ours. These statements may include, or be preceded or followed by, the words "may," "will," "should," "might," "could," "would," "potential," "possi "believe," "expect," "anticipate," "intend," "plan," "estimate," "hope" or similar expressions. We claim the protection of the sa harbor for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995 for all forward-looking statements.

Forward-looking statements are not guarantees of performance. The factors identified below are believed to be significant factors, but not necessarily all of the significant factors, that could cause actual results to differ materially from those expressed in any forward-looking statement. Unpredictable or unknown factors could also have material effects on us.

The following important factors, in addition to those discussed elsewhere in this Annual Report on Form 10-K, could affect our future results and could cause those results or other outcomes to differ materially from those expressed or implied in our forward-looking statements:

- adverse changes in global economic conditions and the resulting effect on the businesses of our clients;
- changes in customer preferences or a failure to otherwise manage relationships with our significant clients;
- loss of brand reputation and decreases in quality of client support and service offerings;
- political and regulatory risks and uncertainty in the countries in which we operate or sell our products and services;
- taxation related risks in multiple jurisdictions;

- adverse credit market conditions and other issues that may affect our ability to obtain future financing on favorable terms;
- limitations on our borrowing capacity in our credit facilities;
- increases in interest rates;
- our ability to make payments on, reduce or extinguish any of our material indebtedness;
- changes in the availability or costs of key materials (such as ink, paper and fuel) or increases in shipping costs;
- our ability to improve operating efficiency rapidly enough to meet market conditions;
- impairment of assets as a result of a decline in our individual reporting units' expected profitability;
- our ability and/or our vendors' ability to implement and maintain information technology and security measures sufficient to protect against breaches and data leakage or the failure to properly use and protect customer, Company and employee information and data;

- a failure in or breach of data held in the computer systems we and our vendors maintain;
- increased pricing pressure as a result of the competitive environment in which we operate;
- successful negotiation, execution and integration of acquisitions;
- our ability to execute on our portfolio optimization strategies, including potential sales of non-core assets;
- increasing health care and benefits costs for employees and retirees;
- changes in our pension and OPEB obligations;
- adverse trends or events in our operations outside of the United States;
- the effect of inflation, changes in currency exchange rates and changes in interest rates;
- catastrophic events which may damage our facilities or otherwise disrupt the business;
- the effect of changes in laws and regulations, including changes in accounting standards, trade, tax, environmental compliance, health and welfare benefits, price controls and other regulatory matters and the cost, which could be substantial, of complying with these laws and regulations;
- changes in the regulations applicable to our clients, which may adversely impact demand for our products and services;
- factors that affect client demand, including changes in postal rates, postal regulations and service levels, changes in the capital markets, changes in advertising markets, clients' budgetary constraints and changes in clients' short-range and long-range plans;
- failures or errors in our products and services;
- changes in technology, including electronic substitution and migration of paper based documents to digital data formats, and our ability to adapt to these changes;
- inability to hire and retain employees;
- the spinoffs resulting in significant tax liability; and
- other risks and uncertainties detailed from time to time in our filings with the SEC.

Because forward-looking statements are subject to assumptions and uncertainties, actual results may differ materially from those expressed or implied by such forward-looking statements. Undue reliance should not be placed on such statements, which speak only as of the date of this document or the date of any document that may be incorporated by reference into this document.

Consequently, readers of this Annual Report on Form 10-K should consider these forward-looking statements only as our current plans, estimates and beliefs. We do not undertake and specifically disclaim any obligation to publicly release the results of any revisions to these forward-looking statements that may be made to reflect future events or circumstances after the date of such statements or to reflect the occurrence of anticipated or unanticipated events. We undertake no obligation to update or revise any forward-looking statements in this Annual Report on Form 10-K to reflect any new events or any change in conditions or circumstances.

ITEM 1A. RISK FACTORS

Our consolidated results of operations, financial position and cash flows can be adversely affected by various risks. These risks include the principal factors listed below and the other matters set forth in this Annual Report on Form 10-K. You should carefully consider all of these risks.

Risks related to our business

Global market and economic conditions, as well as the effects of these conditions on our clients' businesses, may adversely affect us.

In general, demand for our products and services is highly correlated with general economic conditions. Because a significant part of our business relies on our clients' advertising spending, which is driven in part by economic conditions and customer spending, a prolonged downturn in the global economy and an uncertain economic outlook may further reduce the demand for printing and related services that we provide to these clients. Delays or reductions in clients' spending could have an adverse effect on demand for our products and services which may adversely affect our results of operations, financial position and cash flows. Economic weakness and constrained advertising spending may result in decreased revenue, operating margin, earnings and growth rates and difficulty in managing inventory levels and collecting accounts receivable. In addition, client difficulties may result in increases in bad debt write-offs and allowances for doubtful accounts receivable. Economic downturns may also result in restructuring actions and associated expenses and impairment of long-lived assets, including goodwill and other intangibles. Uncertainty about future economic conditions makes it difficult for us to forecast operating results and to make decisions about future investments.

Changes in customer preferences have reduced, and may continue to reduce, demand for our products and services in certain markets. In addition, failure to manage changes in our relationships with our significant clients may have an adverse effect on our results of operations.

Many of the end markets in which our clients compete are experiencing changes due to technological progress and changes in customer preferences. In order to grow and remain competitive, we will need to continue to adapt to future changes in technology, enhance our existing offerings and introduce new offerings to address the changing demands of clients. If we are unable to continue to utilize new and existing technologies to adapt to new distribution methods and address changing customer preferences, our business may be adversely affected.

Technological developments and changing demands of clients may require additional investment in new equipment and technologies. We must monitor changes in our clients' markets and develop new solutions to meet clients' needs. The development of such solutions may be costly and there is no assurance that these solutions will be accepted by clients. If we are unable to adapt to technological changes on a timely basis or at an acceptable cost, clients' demand for our products and services may be adversely affected.

In addition, electronic delivery of documents and data, including the online distribution and hosting of media content, offer alternatives to traditional delivery of printed documents. Customers continue to accept electronic substitution in statement printing and forms while online and digital advertising is impacting clients' printed advertising spend. The extent to which customers will continue to accept electronic delivery is uncertain and it is difficult to predict future acceptance of these alternatives. Electronic delivery has adversely affected our products, such as forms and statement printing. To the extent that customers, clients and regulators continue to accept these alternatives, demand for our products and services may be further adversely affected.

During 2018, our five largest clients accounted for 9.7% of our net sales in the aggregate. In addition, we continue to provide products and services, including logistics, pre-media, production and sales services, to LSC and Donnelley Financial and their respective customers. There can be no assurance that our clients, including LSC and Donnelley Financial, will continue to purchase our products in the same mix or quantities or on the same terms as in the past. The loss of or disruptions related to significant clients may result in a reduction in sales or change in the mix of products we sell to significant clients. This may adversely affect our results of operations, financial condition and cash flows.

Additionally, disputes with significant suppliers, including those related to pricing or performance, may adversely affect our ability to supply products to our clients and also our results of operations, financial condition and cash flows.

Our business is dependent upon brand reputation and the quality of our client support and services offerings. If we fail to offer effective client support and services, our brand reputation could be harmed and clients may not use our products and services, which may have an adverse effect on our results of operations.

A high level of client support and service is critical for the successful marketing and sale of our solutions and the maintenance and enhancement of our brand reputation. If we are unable to provide a level of client support and service to meet or exceed the expectations of our clients, we may experience a loss of clients and market share and a decline in our brand reputation which may result in reduced client demand for our products and services. Furthermore, our brand reputation may be impacted by a wide range of factors, some of which are out of our control, including actions of our competitors and third party providers and positive or negative publicity, any or all of which could adversely affect our operations.

Our operations are subject to political and regulatory risks in the countries in which we operate.

Our operations may be substantially affected by both domestic and international political or regulatory risk including general political conditions in the countries in which we operate; unexpected legal, regulatory or tax changes; governmental actions which have the effect of restriction on our business or opportunities or make it more expensive for us to operate in those jurisdictions; and changes in tax laws that would reduce net income due to withholding requirements or the imposition of tariffs or other restrictions.

In addition, potential political uncertainty in our developed markets, or the perception of such uncertainty, has had and may continue to have an adverse effect on global economic conditions and the stability of global financial markets. This may reduce global market liquidity and restrict the ability of key market participants to operate in certain financial markets. Any of these factors may adversely affect our results of operations, financial position and cash flows. Our success will depend, in part, on our ability to effectively anticipate and manage these and other risks associated with our domestic and international operations.

We are subject to taxation related risks in multiple jurisdictions.

We are a U.S.-based global company subject to tax in multiple U.S. and foreign tax jurisdictions. Significant judgment is required in determining our global provision for income taxes, deferred tax assets and liabilities and in evaluating our tax positions on a worldwide basis. While we believe our tax positions are consistent with the tax laws in the jurisdictions in which we conduct our business, it is possible that these positions may be overturned by jurisdictional tax authorities, which may have a significant impact on our global provision for income taxes.

Tax laws are dynamic and subject to change as new laws are passed and new interpretations of the law are issued or applied. The Tax Cuts and Jobs Act of 2017 (the “Tax Act”) was signed into law on December 22, 2017 and represents the most significant change to U.S. tax law since 1986. As a result of the Tax Act, we recorded a provisional estimate for the one-time transition tax on foreign earnings, as well as other items, in our 2017 results of operations. During 2018, we continued to analyze and interpret new guidance and clarifications of the Tax Act, and as a result recorded adjustments to the provisional estimates. During the fourth quarter of 2018, we finalized our accounting analysis for the income tax effects of the Tax Act. However, in the future, we may be subject to additional taxes as required under the Tax Act, based upon new regulations and guidance which may adversely affect our results of operations, financial position and cash flows.

Many countries are actively considering changes to existing tax laws that, if enacted, could increase our tax obligations in countries where we do business. If U.S. or other foreign tax authorities change applicable tax laws, our overall taxes could increase, which may adversely affect our business, results of operations, financial position and cash flows.

Adverse credit market conditions, our operating performance and our creditworthiness may limit our ability to obtain future financing and the cost of any such capital may be higher than in past periods.

We have a substantial amount of outstanding debt at December 31, 2018 which could adversely affect our business, results of operations, financial condition and cash flows. Uncertainty and volatility in global financial markets may cause financial institutions to fail, lenders to reduce lending or investors to reinvest in assets that are considered less risky. The failure of a financial institution that is a lender under our existing senior secured asset-based revolving credit agreement (the “ABL Credit Agreement”) would reduce the size of our committed revolving credit facility unless a replacement financial institution was willing to provide such commitments. Future capital markets transactions are dependent on our financial performance as well as market conditions, which may result in receiving financing on terms less favorable to us than our existing financings. In addition, our access to future financing and our ability to

refinance existing debt will depend on a variety of factors such as our financial performance, the general availability of credit, our credit ratings and credit capacity at the time we pursue such financing.

Our current corporate credit ratings are below investment grade and, as a result, our borrowing costs may further increase and our ability to borrow may be limited. If adequate capital is not available to us on reasonable terms and our internal sources of liquidity prove to be insufficient, or if future financings require more restrictive covenants, such combination of events could adversely affect our ability to (i) acquire new businesses or enter new markets, (ii) service or refinance our existing debt, (iii) pay dividends on common stock, (iv) make necessary capital investments, and (v) make other expenditures necessary for the ongoing conduct of our business.

Our ABL Credit Agreement limits our borrowing capacity to the value of certain of our assets. In addition, our ABL Credit Agreement and Term Loan B credit facility pursuant to a credit agreement are secured by substantially all assets of our Company and our material domestic subsidiaries that are guarantors under such credit agreements and lenders may exercise remedies against the collateral in the event of our default.

Our borrowing capacity under our ABL Credit Agreement is equal to the lesser of (i) $800.0 million and (ii) a borrowing base formula based on the amount of accounts receivable, inventory, machinery, equipment and, if we were to so elect in the future subject to the satisfaction of certain conditions, fee-owned real estate of the Company and our material domestic subsidiaries that are guarantors under the ABL Credit Agreement, subject to certain eligibility criteria and advance rates (collectively, the "Borrowing Base"). In the event of any material decrease in the amount of or appraised value of the assets in the Borrowing Base, our borrowing capacity would similarly decrease, which could adversely affect our business and liquidity.

Certain restrictions on operations become applicable if our borrowing availability under the ABL Credit Agreement falls below certain thresholds. These restrictions could impose significant operating and financial limitations and restrictions on us, including restrictions on our ability to enter into particular transactions and to engage in other actions that we may believe are advisable or necessary for our business.

In the event of a default under our ABL Credit Agreement or our $550.0 million senior secured Term Loan B credit facility pursuant to a credit agreement (the "Term Loan Credit Agreement," and together with the ABL Credit Agreement, the "Credit Agreements"), the lenders' commitment to extend further credit under our ABL Credit Agreement could be terminated, our outstanding obligations under either or both of the Credit Agreements could become immediately due and payable, outstanding letters of credit issued under our ABL Credit Agreement may be required to be cash collateralized, and remedies may be exercised against the collateral securing either or both of the Credit Agreements. If we are unable to borrow under our ABL Credit Agreement, we may not have the necessary cash resources for our operations and, if any event of default occurs under either Credit Agreement, there is no assurance that we would have the cash resources available to repay such accelerated obligations, refinance such indebtedness on commercially reasonable terms, or at all, or cash collateralize our letters of credit issued under the ABL Credit Agreement, which would have a material adverse effect on our business, financial condition, results of operations and liquidity.

An increase in interest rates could have a material adverse effect on our business.

Borrowings under our Credit Agreements bear interest at rates that are calculated according to a base rate or a Eurocurrency rate plus an applicable margin which, in the case of the ABL Credit Agreement, is dependent on the average quarterly borrowing availability under our ABL Credit Agreement. As a result, we are exposed to risks associated with fluctuations in interest rates, including if the U.S. Federal Reserve raises its benchmark interest rate. Increases in interest rates may adversely affect our business, financial position and results of operations by causing an increase in interest expense. Significantly higher interest rates may also, among other things, reduce the availability and increase the cost of obtaining new debt and refinancing existing indebtedness, as well as negatively impact the market price of our common stock.

We may not be able to reduce or extinguish our material indebtedness, and as a result we may have increased financial leverage, which may adversely affect our business.

We have substantial indebtedness and our interest and principal payments are significant. In addition, our Term Loan Credit Agreement requires us to make amortization payments every quarter equal to 0.25% of the original principal amount of the Term Loan Credit Agreement and to make prepayments with excess cash flow and asset sale proceeds in certain circumstances. If we are unable to reduce this indebtedness, we will continue to have increased financial

leverage which may limit or restrict our ability to operate our business. In addition, our ability to make payments on, repay or refinance, such debt, will depend largely upon our future operating performance.

We may be adversely affected by a decline in the availability of raw materials or by fluctuations in the costs of paper, ink, energy and other raw materials.

We are dependent on the availability of paper, ink and other raw materials to support our operations. As such, purchases of paper, ink, energy and other raw materials represent a large portion of our costs. Increases in the costs of these inputs may increase our costs and we may not be able to pass these costs on to clients through higher prices. Increases in the cost of materials may adversely affect clients' demand for our printing and related services. Other unforeseen developments in these markets may result in a decrease in the supply of paper, ink or other raw materials which may adversely affect our results of operations and financial condition.

We may be unable to improve our operating efficiency rapidly enough to meet market conditions.

Because the markets in which we operate are highly competitive, we must continue to improve our operating efficiency in order to maintain or improve our profitability. There is no assurance that we will be able to do so in the future. In addition, the need to reduce ongoing operating costs may result in significant up-front costs to reduce workforce, close or consolidate facilities, or upgrade equipment and technology.

A decline in our Company's or our individual reporting units' expected profitability may result in the impairment of assets, including goodwill, other long-lived assets and deferred tax assets.

In prior years we have recorded significant goodwill and other long-lived asset impairments and continue to hold goodwill, other long-lived assets and deferred tax assets on our balance sheet. A decline in expected profitability may call into question the recoverability of our related goodwill, other long-lived tangible and intangible assets or deferred tax assets and require the write down or write off of these assets or, in the case of deferred tax assets, recognition of a valuation allowance through a charge to income. Such events have had and may continue to have an adverse effect on our results of operations, financial position and cash flows.

Our services depend on the reliability of computer systems we and our vendors maintain. If our systems fail or are unreliable, our operations may be adversely affected.

We depend on our information technology and data processing systems to operate our business, and a significant malfunction or disruption in the operation of our systems may disrupt our business and adversely affect our ability to operate and compete in the markets we serve. These systems include systems that we own and operate, as well as those systems of our vendors. Such systems are susceptible to malfunctions and interruptions due to equipment damage and power outages and a range of other hardware, software and network problems. We also periodically upgrade and install new systems, which if installed or programmed incorrectly, may cause significant disruptions. If a disruption occurs, we may incur losses and costs for interruption of our operations, which may adversely affect our results of operations, financial condition and cash flows.

We may suffer a material data breach of sensitive information. If our efforts to protect the security of such information are unsuccessful, any such material failures may result in significant costs to investigate and remediate the data-breach, private litigation expense and costly government enforcement actions and penalties, and may have an adverse effect on our operations and reputation.

Maintaining the confidentiality, integrity and availability of our systems, software and solutions is an issue of critical importance for us and our clients and users who rely on us to protect the confidentiality of certain information they provide us. Many of our clients' industries are highly regulated and have established standards and requirements for safeguarding the confidentiality, integrity and availability of information relating to their businesses and customers. Confidential and sensitive information stored in our systems are susceptible to cybercrime, or threats of intentional disruption, which are increasing in terms of sophistication and frequency. Disclosure of the information maintained on our systems due to human error, breach of our systems through hacking or cybercrime, a leak of confidential information due to employee misconduct or other such events may damage our reputation, subject us to regulatory enforcement action and cause significant reputational harm for our clients, all of which may materially affect our results of operations, financial condition and cash flows. In addition, as security threats continue to evolve and increase in terms of sophistication, we may invest additional resources in the security of our systems. The level of investment could also adversely affect our results of operations, financial condition and cash flows.

The highly competitive market for our products and industry consolidation may continue to create adverse price pressures.

The markets for the majority of our product categories are highly fragmented and we have a large number of competitors. We believe excess capacity in our markets has caused downward price pressure and this trend is likely to continue. In addition, consolidation in the markets in which we compete may increase competitive price pressures due to competitors lowering prices.

We believe that selectively pursuing acquisitions is an important strategy for us. If our competitors are able to successfully combine with one another or otherwise consolidate, the competitive landscape would be significantly altered. Such consolidation would create stronger competitors with greater financial resources and broader manufacturing and distribution capabilities than our own, and, if we are not successful with our own efforts to consolidate or adapt effectively to increased competition, the resulting increase in competitive pressures may adversely affect our results of operations, financial position and cash flows.

We have in the past acquired, and intend in the future to acquire, other businesses, and we may be unable to successfully integrate the operations of these businesses and may not achieve the cost savings and increased net sales anticipated as a result of these acquisitions.

Achieving the anticipated benefits of acquisitions will depend in part upon our ability to integrate these businesses in an efficient and effective manner. The integration of companies that have previously operated independently may result in significant challenges, and we may be unable to accomplish the integration smoothly or successfully. In particular, the coordination of geographically dispersed organizations with differences in corporate cultures and management philosophies may increase the difficulties of integration. The integration of acquired businesses may also require the dedication of significant management resources, which may temporarily distract management's attention from our day-to-day operations. In addition, the process of integrating operations may cause an interruption of, or loss of momentum in, the activities of one or more of our businesses and the loss of our key personnel or the acquired businesses. Further, employee uncertainty and lack of focus during the integration process may disrupt our operations or the operations of the acquired businesses. Our strategy is, in part, predicated on our ability to realize cost savings and to increase net sales through the acquisition of businesses that add to the breadth and depth of our products and services. Achieving these cost savings and net sales increases is dependent upon a number of factors, many of which are beyond our control. In particular, we may not be able to realize the benefits of more comprehensive product and service offerings, anticipated integration of sales forces, asset rationalization and systems integration.

The trend of increasing costs to provide health care and other benefits to our employees and retirees may continue.

We provide health care and other benefits to employees and retirees. Costs for health care have increased more rapidly than general inflation in the U.S. economy. If this trend in health care costs continues, our cost to provide such benefits may increase, adversely affecting our profitability. Changes to health care regulations in the U.S. may also increase our cost of providing such benefits.

Changes in market conditions or lower returns on assets may increase required pension and OPEB plan contributions in future periods.

The funded status of our pension and OPEB plans is dependent upon many factors, including returns on invested assets and the level of certain market interest rates. Market conditions may lead to changes in the discount rates used to value the year-end benefit obligations of the plans, which may partially mitigate or worsen the effects of lower asset returns. If adverse market conditions were to continue for an extended period of time, our costs and required cash contributions associated with pension and OPEB plans may substantially increase in future periods.

We may be more vulnerable to adverse events and trends associated with operations outside the U.S.

We have significant operations outside the U.S. Conducting business outside the U.S. subjects us to a number of additional risks and challenges, including:

- periodic changes in a specific country's or region's economic conditions, such as recession;
- compliance with a wide variety of domestic and foreign laws and regulations (including those of municipalities or provinces where we have operations) and unexpected changes in those laws and regulatory requirements, including uncertainties regarding taxes, social insurance contributions and other payroll taxes and fees to governmental entities, tariffs, quotas, export controls, export licenses and other trade barriers;
- unanticipated restrictions on our ability to sell to foreign clients where sales of products and the provision of services may require export licenses;
- certification requirements;
-

fluctuations in foreign currency exchange rates, including those resulting from inflation and currency devaluation activities;

- inadequate protection of intellectual property rights in some countries;
- effects of the United Kingdom's decision to exit the European Union and related potential disruption to trade;
- potential political, legal and economic instability, foreign conflicts, terrorism and the impact of regional and global infectious illnesses in the countries in which we and our clients, suppliers and contract manufacturers are located;
- difficulties and costs of staffing and managing international operations across different geographic areas and cultures, including assuring compliance with the U.S. Foreign Corrupt Practices Act and other U. S. and foreign anticorruption laws; and
- fluctuations in freight rates and transportation disruptions.

These factors, individually or in combination, may impair our ability to effectively deliver our products and services, result in unexpected expenses, or cause an unexpected decline in the demand for our products in certain countries or regions. Specifically with respect to our operations in China, our financial performance may be subject to the following risks, among others, regulation of foreign investment and business activities by the Chinese government, including scrutiny of foreign companies, may limit our ability to expand our business in China; uncertainties with respect to the legal system in China may limit the legal protections available to us in China; government restrictions on the remittance of currency out of China and the ability of any subsidiary we may establish in China to pay dividends and make other distributions to us; unfavorable result of ongoing trade negotiations between the U.S. and China; and potential unfavorable tax and tariff consequences as a result of our operations in China. Our failure to manage the risks and challenges associated with our international business and operations may adversely affect our results of operations, financial position and cash flows.

We are exposed to significant risks related to potential adverse changes in currency exchange rates.

We are exposed to market risks resulting from changes in the currency exchange rates of the currencies in the countries in which we do business. Although operating in local currencies may limit the impact of currency rate fluctuations on the operating results of our non-U.S. subsidiaries, fluctuations in such rates may affect the translation of these results into our Consolidated Financial Statements. To the extent borrowings, sales, purchases, revenues and expenses or other transactions are not in the applicable local currency, we may enter into foreign currency spot and forward contracts to hedge the currency risk. We cannot provide assurance, however, that our efforts at hedging will be successful, and such efforts may, in certain circumstances, adversely affect our results of operations, financial position and cash flows.

Catastrophic events may damage or destroy our factories, distribution centers or other facilities, which may disrupt our business.

Natural disasters, conflicts, wars, terrorist attacks, fires or other catastrophic events may cause damage or disruption to our factories, distribution centers or other facilities, which may adversely affect our ability to manage logistics, cause delays in the delivery of products and services to our clients, and create inefficiencies in our supply chain. An event of this nature may also prevent us from maintaining ongoing operations and performing critical business functions. While we maintain backup systems and operate out of multiple facilities to reduce the potentially adverse effect of these types of events, a catastrophic event that results in the destruction of any of our major factories, distribution centers or other facilities would affect our ability to conduct normal business operations, which may adversely affect our results of operations, financial position and cash flows.

Changes in rules and regulations to which we are subject may increase our costs, which may adversely affect us.

We are subject to numerous rules and regulations, including, but not limited to, product safety, environmental and health and welfare benefit regulations. These rules and regulations may be changed by local, state or federal governments in countries in which we operate. Changes in these regulations may result in a significant increase in our costs to comply. Compliance with changes in rules and regulations may require increases to our workforce, increased cost for compensation and benefits, or investments in new or upgraded equipment. In addition, growing concerns about climate change, including the impact of global warming, may result in new regulations with respect to greenhouse gas emissions (including carbon dioxide) and/or “cap and trade” legislation. Compliance with new rules and regulations or changes in existing rules and regulations may result in additional costs, which may adversely affect our results of operations, financial condition and cash flows.

Many of our clients are subject to rules and regulations requiring certain printed or electronic communications, governing the form of such communications and protecting the privacy of customers. For instance, our healthcare and

insurance printing businesses are subject to such regulations. Changes in these regulations may impact clients' business practices and may reduce demand for our products and services. Changes in such regulations may eliminate the need for certain types of communications altogether or may impact the quantity or format of such communications.

Changes in postal rates, regulations and delivery structure may adversely affect demand for our products and services.

Postal costs are a significant component of many of our clients' cost structure and postal rate changes can influence the number of pieces and types of mailings that our clients mail. In accordance with the 2006 PAEA, the PRC adjusted and approved USPS filings for a CPI based average price increases of 1.9% to 2.0% depending on the class of mail effective January 21, 2018 and a CPI based average price increase of 2.5% on average for the Market Dominant mail classes effective January 27, 2019.

Additionally, as required on the 10-year anniversary of PAEA, the PRC initiated a comprehensive review of PAEA on December 20, 2016, to determine if the current system for regulating rates and classes for market-dominant products is still achieving the original objectives of the law. The PRC issued its findings on December 1, 2017 and concluded that the current system was not meeting all of PAEA's original objectives. To remedy this situation, the PRC proposed recommendations, which among other things, allows the Postal Service flexibility of "CPI + 2%" on market-dominant mail products for a 5-year period of time. The PRC asked for industry stakeholder input, comments and alternative suggestions to these recommendations which were due by March 1, 2018. The PRC is expected to issue additional communications regarding this 10-year review in early 2019.

In other developments, the Trump administration on April 12, 2018 issued an Executive Order establishing a TF to evaluate the USPS. On December 4, 2018, the TF issued a formal report calling for a total reevaluation of the Postal Service business model to make the organization more viable and sustainable going into the future.

The impact of any restructuring of the USPS, which may require legislative action, cannot currently be estimated. If implemented, certain changes may impact our clients' ability or willingness to communicate by mail. Declines in print volumes mailed would have an adverse effect on our results of operations, financial condition and cash flows.

Increased transportation costs and changes in the relationships with independent shipping companies may have an adverse effect on our business.

We rely upon third party carriers for timely delivery of our product shipments. As a result, we are subject to carrier disruptions and increased costs due to factors that are beyond our control, including employee strikes, inclement weather and increased fuel costs. Any failure to deliver products to our clients in a timely and accurate manner may damage our reputation and brand and may cause us to lose clients. If our relationship with any of these third party carriers is terminated or impaired, or if any of these third parties are unable to ship products for us, we would be required to use alternative, and possibly more expensive, carriers for the shipment of products. We may be unable to engage alternative carriers on a timely basis or on terms favorable to us, if at all, which may have an adverse effect on our results of operations, financial condition and cash flows.

Furthermore, shipping costs represent a significant operational expense for us. Changes in shipping terms, or the inability of these third party shippers to perform effectively (whether as a result of mechanical failure, casualty loss, labor stoppage, or any other reason), may have an adverse effect on our results of operations, financial condition and cash flows. Additionally, deterioration of the financial condition of these third-party carriers may have an adverse effect on our shipping costs. Any future increases in shipping rates may have an adverse effect on our results of operations, financial condition and cash flows, particularly if we are unable to pass on these higher costs to our clients.

Undetected errors or failures found in our products and services may result in loss of or delay in market acceptance of our products and services that may seriously harm our business.

Our products and services may contain undetected errors or scalability limitations at any point, but particularly when first introduced or as new versions are released. We frequently release new versions of our products and different aspects of our platform are in various stages of development. Despite testing by us and by current and potential clients, errors may not be found in new products and services until after commencement of commercial availability or use, resulting in a loss of or a delay in market acceptance, damage to our reputation, client dissatisfaction and reductions in net sales and margins, any of which may have an adverse effect on our results of operations, financial condition and cash flows.

We may be unable to hire and retain talented employees, including management.

Our success depends, in part, on our general ability to attract, develop, motivate and retain highly skilled employees. The loss of a significant number of our employees or the inability to attract, hire, develop, train and retain skilled personnel, particularly during strong economic periods, may have an adverse effect on us. Various locations may encounter competition with other manufacturers for skilled labor. Many of these competitors may be able to offer significantly greater compensation and benefits or more attractive lifestyle choices than we offer. In addition, many members of our management team have significant industry experience that is valuable to our competitors. We enter into non-solicitation and, as appropriate, non-competition agreements with certain of our executive officers, prohibiting them contractually from soliciting our clients and employees and from leaving and joining a competitor within a specified period. Our inability to hire and retain talented employees or the loss of senior members of our senior management team may result in challenges or temporary difficulty in managing our business, which may adversely affect our results of operations, financial condition or cash flows.

The spinoff transactions could result in significant tax liability.

We obtained an opinion from our outside legal counsel substantially to the effect that, among other things, the distributions in connection with the spinoff transactions qualify as tax-free distributions under the U.S. Internal Revenue Code of 1986, as amended (the "Code"). The opinion will not be binding on the IRS or the courts. Additionally, we have received a private letter ruling from the IRS concluding that certain limited aspects of the distributions will not prevent the distributions from satisfying certain requirements for tax-free treatment under the Code. The opinion and the private letter ruling rely on customary factual representations and assumptions, which if incorrect or inaccurate may jeopardize the ability to rely on such opinion and letter ruling.

If either or both of the distributions do not qualify for tax-free treatment for U.S. federal income tax purposes, then, in general, we would be subject to tax as if we had sold the common stock of such spun-off entity in a taxable sale for its fair value. In that case, we expect that RRD stockholders would be subject to tax as if they had received a distribution equal to the fair value of the spun-off entity's common stock that was distributed to them, which generally would be treated first as a taxable dividend to the extent of our earnings and profits, then as a non-taxable return of capital to the extent of each holder's tax basis in its Company common stock, and thereafter as capital gain with respect to any remaining value. We expect that the amount of any such taxes to RRD stockholders and us would be substantial if this were to occur.

ITEM 1B. UNRESOLVED STAFF COMMENTS

We have no unresolved written comments from the SEC staff regarding our periodic or current reports under the Securities Exchange Act of 1934.

ITEM 2. PROPERTIES

Our corporate office is located in leased office space in Chicago, Illinois. As of December 31, 2018, we leased or owned 214 U.S. facilities, some of which had multiple buildings and warehouses, and these U.S. facilities encompassed approximately 15.2 million square feet. We leased or owned 88 international facilities, some of which had multiple buildings and warehouses, encompassing approximately 6.4 million square feet primarily in Asia, Europe, Canada and Latin America. Of our U.S. and international facilities, approximately 9.2 million square feet of space was owned, while the remaining 12.4 million square feet of space was leased.

ITEM 3. LEGAL PROCEEDINGS

From time to time, our clients and others file voluntary petitions for reorganization under United States bankruptcy laws. In such cases, certain pre-petition payments we received from these parties could be considered preference items and subject to return. In addition, we are party to certain litigation arising in the ordinary course of business. We believe that the final resolution of these preference items and litigation will not have a material effect on our consolidated results of operations, financial position or cash flows.

For a discussion of certain litigation involving us, see Note 9, Commitments and Contingencies, to the Consolidated Financial Statements.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

EXECUTIVE OFFICERS OF R.R. DONNELLEY & SONS COMPANY (As of February 1, 2019)

Name and Positions with the Company	Age	Business Experience
Daniel L. Knotts President and Chief Executive Officer	54	Since October 2016, Mr. Knotts has served as the Chief Executive Officer of RRD and a member of our board of directors. Prior to this, Mr. Knotts was our Chief Operating Officer from 2013 to 2016.
Terry D. Peterson Executive Vice President and Chief Financial Officer	54	Since October 2016, Mr. Peterson has served as RRD's Executive Vice President and Chief Financial Officer. Prior to joining RRD, Mr. Peterson served as Senior Vice President and Chief Financial Officer of Deluxe Corporation from 2009 to 2016.
Kenneth O'Brien Executive Vice President and Chief Information Officer	58	Since February 2004, Mr. O'Brien has served as RRD's Executive Vice President and Chief Information Officer.
John Pecaric President, RRD Business Services	56	Since April 2018, Mr. Pecaric has served as President of RRD Business Services. Prior to this, Mr. Pecaric was our Executive Vice President, Chief Commercial Officer and President of International from 2016 to 2018. From 2014 to 2016, Mr. Pecaric was Group President – International where he led RRD's businesses outside the United States. From 2012 to 2014, Mr. Pecaric was Senior Vice President of Canada, Latin America, Book and Office Products.
J. Glynn Perry Executive Vice President, Domestic Operations and Chief Supply Chain Officer	59	Since October 2016, Mr. Perry has served as RRD's Executive Vice President of Domestic Operations and Chief Supply Chain Officer. Prior to this, Mr. Perry served in various capacities at RRD including President of Commercial & Variable Print from 2014 to 2016 and Senior Vice President of Operations from 2000 to 2013.
Sheila M. Rutt Executive Vice President and Chief Human Resources Officer	50	Since July 2017, Ms. Rutt has served as RRD's Executive Vice President and Chief Human Resources Officer. Prior to joining RRD, Ms. Rutt served as Chief Human Resources Officer of Diebold Nixdorf from 2005 to 2017.
Doug Ryan	56	Since April 2018, Mr. Ryan has served as President of RRD Marketing Solutions. Prior to this, Mr. Ryan was our Executive Vice President of Marketing Services from 2017 to 2018. Prior to joining RRD, Mr. Ryan served as President of North America

President, RRD Marketing Solutions		for Digitas from 2016 to 2017 and President of San Francisco and Chicago for Digitas from 2010 to 2016.
Michael J. Sharp Senior Vice President, Controller and Chief Accounting Officer	57	Since November 2017, Mr. Sharp has served as RRD's Senior Vice President, Controller and Chief Accounting Officer. Prior to joining RRD, Mr. Sharp served in various capacities at AAR Corporation including, Vice President and Chief Financial Officer from 2015 to 2016; Vice President, Controller and Chief Accounting Officer from 1999 to 2015; and interim Vice President and Chief Financial Officer from 2012 to 2013.
Deborah L. Steiner Executive Vice President, General Counsel, Secretary and Chief Compliance Officer	48	Since October 2016, Ms. Steiner has served as RRD's Executive Vice President, General Counsel, Secretary and Chief Compliance Officer. Prior to this, Ms. Steiner was our Vice President, Associate General Counsel from 2012 to 2016.

PART II

ITEM 5. MARKET FOR R.R. DONNELLEY & SONS COMPANY'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Effective August 22, 2016, our common stock is listed and traded on the New York Stock Exchange (NYSE) under the symbol "RRD". Prior to that date, our stock was listed and traded on the Nasdaq Stock Market ("NASDAQ") under the symbol "RRD". As of February 22, 2019, there were 3,876 stockholders of record of our common stock.

ISSUER PURCHASES OF EQUITY SECURITIES

There were no repurchases of equity securities during the three months ended December 31, 2018.

EQUITY COMPENSATION PLANS

For information regarding equity compensation plans, see Item 12 of Part III of this Annual Report on Form 10-K.

PEER PERFORMANCE TABLE

The graph below compares five-year returns of our common stock with those of the S&P SmallCap 600 and the S&P 1500 Industrials Index. The comparison assumes an initial investment of $100 on December 31, 2013 and that all dividends have been reinvested. Our performance through September 30, 2016 has been adjusted for the spinoffs of LSC and Donnelley Financial which occurred on October 1, 2016 and are reflected in the table below as a dividend. Additionally, our performance has been adjusted for the 1-for-3 reverse stock split for our stock which also occurred on October 1, 2016.

	Base Period	Fiscal Years Ended December 31,				
Company Name/Index	2013	2014	2015	2016	2017	2018
RR Donnelley	100	88.01	81.81	64.95	38.90	17.44
S&P SmallCap 600	100	105.76	103.67	131.20	148.56	135.96
S&P 1500 Industrials Index	100	108.48	105.53	127.07	153.83	133.25

ITEM 6. SELECTED FINANCIAL DATA
SELECTED FINANCIAL DATA

(in millions, except per share data)

	2018	2017	2016	2015	2014
Continuing Operations					
Net sales	$6,800.2	$6,939.6	$6,833.0	$6,880.7	$7,118.0
Net loss from continuing operations[1]	(9.6)	(33.2)	(484.9)	(31.7)	(40.3)
Net loss attributable to RRD common stockholders per diluted share[1][2]	(0.16)	(0.49)	(6.95)	(0.28)	(0.66)
Financial Position and Other Data					
Total assets[3]	3,640.8	3,904.5	4,268.8	7,264.6	7,598.0
Long-term debt[3]	1,875.3	2,098.9	2,379.2	3,188.3	3,398.6
Cash dividends per common share[2]	0.34	0.56	2.48	3.12	3.12

(1) Includes the following significant items:

	2018	2017	2016	2015	2014
Restructuring, impairment and other charges-net	$38.8	$53.0	$584.3	$62.7	$72.3
Acquisition-related expenses	0.1	—	2.7	0.5	7.0
Spinoff-related transaction expenses	—	3.3	8.0	—	—
Gain from the sale of certain of our affordable housing investments	(0.4)	(1.3)	(0.1)	(3.9)	—
Pension settlement and plan amendments charges	1.9	1.6	21.1	—	—
OPEB curtailment gain	—	—	(19.5)	—	—
Net gain on disposal of businesses	(3.7)	—	(11.9)	—	(10.4)
Loss on Venezuela currency remeasurement	—	—	—	30.3	18.4
Loss primarily related to the disposal of the Venezuelan operating entity	—	—	—	15.7	—
Loss from the impairment of our investment in the Brazilian operations of Courier	—	—	—	2.8	—
Net gain on sale of LSC and Donnelley Financial shares	—	(42.4)	—	—	—
Loss from the impairment of equity investments	—	—	1.4	1.3	1.3
Loss on debt extinguishment	32.4	20.1	—	—	77.1
Loss on bankruptcy liquidation of RRDA	—	—	—	—	16.4
Purchase accounting inventory adjustments	—	—	—	—	12.1
Total charges before taxes	$69.1	$34.3	$586.0	$109.4	$194.2
Total after-tax impact of the above charges, excluding the impact of noncontrolling interests	61.4	11.2	534.9	87.9	138.3
Tax benefit related to the decline in value of an entity within the Business Services segment	—	—	—	—	(15.2)
Deferred income tax benefit	(6.4)	(3.0)	(0.4)	—	—
Tax expense related to the enactment of the Tax Act	5.7	110.3	—	—	—
Total charges, net of taxes	$60.7	$118.5	$534.5	$87.9	$123.1

(2) Earnings per share amounts and dividends paid per share amounts occurring prior to October 1, 2016 have been adjusted to reflect our 1-for-3 reverse stock split. See Note 1, Basis of Presentation and Summary of Significant Accounting Policies, to the Consolidated Financial Statements.

(3) Includes Donnelley Financial and LSC data for periods prior to the October 1, 2016 Distribution. See Note 2, Discontinued Operations, to the Consolidated Financial Statements for information on the divested net assets and long-term debt.

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

The following discussion of our financial condition and results of operations should be read together with the Consolidated Financial Statements and Notes to those statements included in Item 15 of Part IV of this Annual Report on Form 10-K.

On October 1, 2016, we completed the spinoff transactions of LSC and Donnelley Financial into two independent public companies as described in more detail in Item 1, Business –Spinoff Transactions, of Part I of this Annual Report on Form 10-K. The financial results of Donnelley Financial and LSC for periods prior to the Distribution have been reflected within the disclosures of this Management's Discussion and Analysis of Financial Condition and Results of Operations as discontinued operations. Additionally, sales from RRD to Donnelley Financial and LSC previously eliminated in consolidation have been recast and are now shown as external sales of RRD within the financial results from continuing operations. See Note 2, Discontinued Operations, to the Consolidated Financial Statements for additional information.

Business

For a description of our business, segments and product and service offerings, see Item 1, Business, of Part I of this Annual Report on Form 10-K.

We separately report our net sales, related costs of sales and gross profit for our product and service offerings. Our product offerings primarily consist of commercial print, packaging, statements, direct marketing, labels, digital print and fulfillment, supply chain management and forms. Our service offerings primarily consist of logistics, business process outsourcing and digital and creative solutions.

Executive Overview

2018 OVERVIEW

Net sales for the year ended December 31, 2018 were $6,800.2 million, a decrease of $139.4 million, or 2.0%, compared to the year ended December 31, 2017. Net sales decreased $225.9 million due to the disposition of our Print Logistics business. Net sales also decreased due to lower volume in commercial print due to ongoing secular pressure and lower specialty card sales, as well as price pressures. Decreases in net sales were offset by higher volume primarily in packaging, the remaining logistics business and direct marketing.

Income from operations for the year ended December 31, 2018 was $208.6 million, a decrease of $2.8 million compared to the year ended December 31, 2017. Income from operations decreased due to cost inflation, price pressures and unfavorable mix in sales, partially offset by cost control initiatives, higher volume net of the sale of Print Logistics, lower impairment and other charges and lower depreciation and amortization expense.

We continue to assess opportunities to reduce our cost structure and enhance productivity throughout the business. During the year ended December 31, 2018, we realized cost savings from previous restructuring activities, including the reorganization of administrative and support functions across all segments, as well as facility consolidations.

Net cash provided by operating activities for the year ended December 31, 2018 was $203.5 million as compared to $217.9 million for the year ended December 31, 2017. The decrease in net cash flow from operating activities related primarily to a reduction in operating income, including the sale of our Print Logistics business, partially offset by lower tax and interest payments.

OUTLOOK

Vision and Strategy

We work with our clients to create, manage, deliver and optimize their multichannel communications strategies. We have and will continue to develop our creative and design, content management, digital and print production, supply chain management and distribution services to address our clients' evolving needs.

Our global platform provides differentiated solutions for our clients through our broad range of complementary communications services and innovative leadership in both conventional print and digital technologies. This platform has enabled RRD to develop strong client relationships, and we are focused on expanding these relationships to a broader range of our offerings. The flexibility of our platforms enhances the value we deliver to our clients and we intend to expand our capabilities in order to make it easier for clients to manage their full range of communication needs.

We believe productivity improvements and cost reductions are critical to our competitiveness. We continue to implement strategic initiatives across each of our segments to reduce our overall cost structure and enhance productivity primarily through restructuring which includes consolidations, reorganizations and integrations of operations and streamlining of administrative and support activities.

We seek to deploy our capital using a balanced approach in order to ensure financial flexibility and provide returns to stockholders. Priorities for capital deployment, over time, include capital expenditures, principal and interest payments on debt obligations, distributions to stockholders and targeted acquisitions. We believe that a strong financial condition is important to clients focused on establishing or growing long-term relationships. We also expect to make targeted acquisitions that extend our capabilities, drive cost savings and reduce future capital spending needs.

We use several key indicators to gauge progress toward achieving these objectives. These indicators include organic sales growth, operating margins, cash flow from operations and capital expenditures. We target long-term net sales growth, while managing operating margins by achieving productivity improvements that offset the impact of price declines and cost inflation. Cash flows from operations are targeted to be stable over time, but in any given year can be significantly impacted by the timing of non-recurring or infrequent receipts and expenditures, the level of required pension and OPEB plan contributions, the timing of tax payments and the impact of working capital changes.

We face many challenges and risks as a result of competing in highly competitive global markets. Refer to Item 1A, Risk Factors, of Part I of this Annual Report on Form 10-K for further discussion.

2019 Outlook

In 2019, we expect net sales to be down as compared to 2018 primarily due to the sale of our Print Logistics business which reported net sales of $203.3 million in 2018. On an organic basis, we expect net sales to range from a slight decrease to a slight increase as compared to 2018 primarily driven by expected growth in our direct marketing, packaging and labels products as well as continued secular declines in our commercial print and forms products and continued price pressures in most parts of the business. The highly competitive market conditions and unused industry capacity will continue to put price pressure on both transactional work and contract renewals across both segments. Our outlook assumes that the U.S. economy and the economies of the foreign countries in which we operate will remain stable. We will continue to leverage our client relationships in order to provide a larger share of their communications needs. In addition, we expect to continue cost control and productivity initiatives, including selected facility consolidations.

We initiated several restructuring actions during the years ended December 31, 2018, 2017 and 2016, to further reduce our overall cost structure. These restructuring actions included the closures of manufacturing facilities as well as the reorganization and consolidation of certain operations. These and future cost reduction actions are expected to have a positive impact on operating earnings in 2019 and in future years. In addition, we expect to identify other cost reduction opportunities and possibly take further actions in, which may result in significant additional restructuring charges. These restructuring actions will be funded by cash generated from operations and cash on hand or, if necessary, by utilizing our credit facilities.

We expect lower interest expense on lower average borrowings and a lower average interest rate in 2019 and we expect the effective tax rate to be significantly higher than the statutory rate primarily due to anticipated limitations on our domestic interest expense deduction as a result of the Tax Act.

Cash flows from operations in 2019 are expected to be lower versus 2018 as lower interest expense and expected targeted working capital improvements will be offset by significantly higher payments for income taxes and restructuring. We collected domestic tax refunds in 2018 which we do not expect to repeat in 2019. In addition, we

plan to re-locate a printing facility in China which we expect will result in additional severance and relocation costs. This move is necessary as we are selling our current printing facility. We expect capital expenditures to be temporarily higher in 2019 due to investments associated with building the new printing facility in China and additional investments related to the $115.0 million 2020 Census contract we were awarded at the end of 2018. In 2020, we expect our capital expenditures level to return to our previously stated range of 1.5 to 1.7 percent of revenue. Lastly, as part of our agreement to sell the printing facility in China, we expect to collect an additional non-refundable deposit of approximately $25.0 million in 2019.

RESULTS OF OPERATIONS FOR THE YEAR ENDED DECEMBER 31, 2018 AS COMPARED TO THE YEAR ENDED DECEMBER 31, 2017

Consolidated

The following table shows the results of operations for the years ended December 31, 2018 and 2017:

	Year Ended December 31,			
	2018	2017	$ Change	% Change
	(in millions, except percentages)			
Products net sales	$5,317.7	$5,326.0	$(8.3)	(0.2)%
Services net sales	1,482.5	1,613.6	(131.1)	(8.1)%
Total net sales	6,800.2	6,939.6	(139.4)	(2.0)%
Products cost of sales (exclusive of depreciation and amortization)	4,315.8	4,264.1	51.7	1.2%
Services cost of sales (exclusive of depreciation and amortization)	1,229.0	1,359.3	(130.3)	(9.6)%
Total cost of sales	5,544.8	5,623.4	(78.6)	(1.4)%
Products gross profit	1,001.9	1,061.9	(60.0)	(5.7)%
Services gross profit	253.5	254.3	(0.8)	(0.3)%
Total gross profit	1,255.4	1,316.2	(60.8)	(4.6)%
Selling, general and administrative expenses (exclusive of depreciation and amortization)	830.4	860.4	(30.0)	(3.5)%
Restructuring, impairment and other charges-net	38.8	53.0	(14.2)	(26.8)%
Depreciation and amortization	181.4	191.4	(10.0)	(5.2)%
Other operating income	(3.8)	—	(3.8)	nm
Income from operations	$208.6	$211.4	$(2.8)	(1.3)%

Net sales of products for the year ended December 31, 2018 decreased $8.3 million, or 0.2%, to $5,317.7 million versus the same period in 2017, including a $9.7 million, or 0.2%, increase due to changes in foreign exchange rates. Net sales of products decreased due to lower volume in commercial print due to ongoing secular pressure and lower specialty card sales, as well as price pressure, partially offset by higher volume in packaging and direct marketing.

Net sales from services for the year ended December 31, 2018 decreased $131.1 million, or 8.1%, to $1,482.5 million versus the same period in 2017, including a $2.9 million, or 0.2%, increase due to changes in foreign exchange rates. Net sales from services decreased $225.9 million due to the disposition of our Print Logistics business. Net sales increased due to higher volume in the remaining logistics business and business process outsourcing, partially offset by lower volume in digital and creative solutions as we continue our shift away from traditional pre-media services for non-core market segments.

Products cost of sales increased $51.7 million, or 1.2%, for the year ended December 31, 2018 versus the same period in 2017. Products cost of sales increased primarily due to higher volume in packaging and cost inflation, including higher paper costs in the U.S., partially offset by lower volume in commercial print, along with cost control initiatives across the organization. As a percentage of net sales, products cost of sales increased 1.1 percentage points to 81.2% for the year ended December 31, 2018 versus the same period in 2017.

Services cost of sales decreased $130.3 million, or 9.6%, for the year ended December 31, 2018 versus the same period in 2017, primarily due to the disposition of our Print Logistics business and cost control initiatives, partially offset by higher volume in the remaining logistics business and business process outsourcing. As a percentage of net sales, services cost of sales decreased 1.3 percentage points for the year ended December 31, 2018 versus the same period in 2017.

Products gross profit decreased $60.0 million to $1,001.9 million for the year ended December 31, 2018 versus the same period in 2017, primarily due to price pressures, partially offset by cost control initiatives. Products gross margin decreased from 19.9% to 18.8%.

Services gross profit decreased $0.8 million to $253.5 million for the year ended December 31, 2018 versus the same period in 2017. Services gross margin increased from 15.8% to 17.1% primarily due to the mix of services sold.

Selling, general and administrative expenses decreased $30.0 million to $830.4 million for the year ended December 31, 2018 versus the same period in 2017 reflecting cost control initiatives and lower foreign exchange losses, partially offset by higher bad debt expense in 2018, which included an $8.3 million charge due to a client-related bankruptcy and higher commission and performance-based incentive compensation expenses. As a percentage of net sales, selling, general and administrative expenses decreased from 12.4% to 12.2% for the years ended December 31, 2018 versus the same period in 2017.

For the year ended December 31, 2018, we recorded net restructuring, impairment and other charges of $38.8 million, including $16.6 million for lease termination and other restructuring charges, $12.9 million for employee termination costs and $9.3 million for impairment and other charges, including multi-employer pension plan ("MEPP") withdrawal obligations. See Note 5, Restructuring, Impairment and Other Charges, to the Consolidated Financial Statements for further discussion.

Depreciation and amortization decreased $10.0 million to $181.4 million for the year ended December 31, 2018 versus the same period in 2017, primarily due to lower capital spending in recent years compared to historical levels.

During the year ended December 31, 2018, we completed the sale of our Print Logistics business and recorded a pre-tax gain of $3.6 million, which is reflected in Other operating income.

Income from operations for the year ended December 31, 2018 was $208.6 million, a decrease of $2.8 million compared to the year ended December 31, 2017.

	Year Ended December 31,			
	2018	2017	$ Change	% Change
	(in millions, except percentages)			
Interest expense-net	$168.3	$179.6	$ (11.3)	(6.3 %)
Investment and other income-net	(20.4)	(63.8)	43.4	(68.0 %)
Loss on debt extinguishment	32.4	20.1	12.3	61.2 %

Net interest expense decreased by $11.3 million for the year ended December 31, 2018 versus the same period in 2017, primarily due to lower average borrowings and interest rates during the year ended December 31, 2018.

Net investment and other income for the year ended December 31, 2018 was $20.4 million and principally comprised of net pension and OPEB income. Net investment and other income for the year ended December 31, 2017 was $63.8 million and included a non-cash net realized gain of $94.0 million on the retained shares of Donnelley Financial exchanged for certain of our senior notes outstanding, net pension and OPEB income and a gain of $1.3 million resulting from the sale of certain of our affordable housing investments, partially offset by a net realized loss of $51.6 million resulting from the sale of our retained shares of LSC.

Loss on debt extinguishments for the year ended December 31, 2018 was $32.4 million which primarily related to premiums paid in connection with tenders, unamortized debt issuance costs and other expenses associated with the October 2018 tender offer. Loss on debt extinguishments for the year ended December 31, 2017 was $20.1 million which related to premiums paid in connection with the 2017 tenders, unamortized debt issuance costs and other expenses associated with the debt-for-equity exchange of senior notes, the repurchase of debentures and senior notes and the amendment and restatement of the credit agreement. See Note 12, Debt, to the Consolidated Financial Statements for further discussion.

	Year Ended December 31,			
	2018	2017	$ Change	% Change

	(in millions, except percentages)			
Earnings before income taxes	$28.3	$75.5	$ (47.2)	(62.5 %)
Income tax expense	37.9	108.7	(70.8)	(65.1 %)
Effective income tax rate	133.9%	144.0%		

The effective income tax rate for the year ended December 31, 2018 was an expense of 133.9% and is primarily driven by limitations on our interest expense deduction as a result of the Tax Act. Non-deductible interest expense will be carried forward; however, it is more likely than not that the benefit of such deferred tax asset will not be fully realized and a valuation allowance of $23.9 million was recorded. The income tax expense also reflects final adjustments associated with the enactment of the Tax Act of $4.2 million to the one-time transition tax on foreign earnings, as well as $1.5 million to net deferred tax assets for the reduced corporate income tax rate. Additionally, the income tax expense reflects the inability to recognize a tax benefit on certain losses.

The effective income tax rate for the year ended December 31, 2017 was an expense of 144.0% which reflects the impact associated with the enactment of the Tax Act which included a provisional estimate for the one-time transition tax on foreign earnings of $103.5 million, as well as a provisional adjustment to the net deferred tax assets for the reduced corporate income tax rate of $6.8 million. The income tax expense also reflects the impact of impairment of goodwill, the inability to recognize a tax benefit on certain losses and the impact of the net gain on disposition of investments. The Donnelley Financial retained shares were disposed in a non-taxable debt-for-equity exchange. The sale of the LSC retained shares generated a capital loss which will be carried forward; however, it was determined at the time of the sale that the benefit of such deferred tax asset would not be fully realized and a valuation allowance was recorded.

Income attributable to noncontrolling interests was $1.4 million and $1.2 million for the years ended December 31, 2018 and 2017, respectively.

Net loss from continuing operations for the year ended December 31, 2018 was $9.6 million compared to $33.2 million for the year ended December 31, 2017.

Information by Segment

Business Services

	Year Ended December 31,			
	2018		2017	
	(in millions, except percentages)			
Net sales	$5,619.1		$5,762.7	
Income from operations	242.3		248.6	
Operating margin	4.3	%	4.3	%
Restructuring, impairment and other charges-net	25.8		17.8	
Gain on disposal of businesses	(3.7)		—	

Net sales for the Business Services segment for the year ended December 31, 2018 were $5,619.1 million, a decrease of $143.6 million, or 2.5%, compared to 2017. Net sales decreased $225.9 million due to the disposition of our Print Logistics business. Net sales also decreased due to lower volume in commercial print due to ongoing secular pressure and lower specialty card sales as well as price pressures across the segment. Decreases in net sales were offset by higher volume in packaging, the remaining logistics business and business process outsourcing, increased fuel surcharges in logistics, pass-through of higher paper costs in Asia as well as $12.6 million of favorable changes in foreign exchange rates. The following table summarizes net sales by products and services in the Business Services segment:

	Year Ended December 31,				
Products and Services	2018	2017	$ Change	% Change	
	(in millions, except percentages)				
Commercial print	$1,935.6	$2,114.0	$(178.4)	(8.4)	%
Logistics	1,109.3	1,238.2	(128.9)	(10.4)	%
Packaging	672.0	562.1	109.9	19.6	%
Statements	584.2	556.4	27.8	5.0	%
Labels	481.4	470.4	11.0	2.3	%
Supply chain management	321.0	314.9	6.1	1.9	%
Forms	267.5	284.5	(17.0)	(6.0)	%
Business process outsourcing	248.1	222.2	25.9	11.7	%
Total Business Services	$5,619.1	$5,762.7	$(143.6)	(2.5)	%

Business Services segment income from operations decreased $6.3 million for the year ended December 31, 2018 compared to the same period in 2017, primarily due to an unfavorable mix in sales, price pressures across the segment and cost inflation, partially offset by pass-through of higher paper costs in Asia, cost control initiatives, lower depreciation expense, higher fuel surcharges and lower start-up expenses associated with the packaging business in Asia.

Marketing Solutions

	Year Ended December 31,	
	2018	2017
	(in millions, except percentages)	
Net sales	$1,181.1	$1,176.9
Income from operations	54.6	30.8
Operating margin	4.6 %	2.6 %
Restructuring, impairment and other charges-net	3.9	25.3

Net sales for the Marketing Solutions segment for the year ended December 31, 2018 were $1,181.1 million, an increase of $4.2 million, or 0.4%, compared to 2017. Net sales increased primarily due to higher volume in direct marketing, mostly offset by lower volume in digital and creative solutions as we continue our shift away from traditional pre-media services for non-core market segments and lower volume in digital print and fulfillment. The following table summarizes net sales by products and services in the Marketing Solutions segment:

Products and Services	Year Ended December 31, 2018	2017	$ Change	% Change
	(in millions, except percentages)			
Direct marketing	$581.6	$545.7	$ 35.9	6.6 %
Digital print and fulfillment	474.4	478.0	(3.6)	(0.8 %)
Digital and creative solutions	125.1	153.2	(28.1)	(18.3 %)
Total Marketing Solutions	$1,181.1	$1,176.9	$ 4.2	0.4 %

Marketing Solutions segment income from operations increased $23.8 million for the year ended December 31, 2018 compared to the same period in 2017, primarily due to lower restructuring and impairment charges and cost control initiatives, partially offset by lower volume in digital and creative solutions and unfavorable mix in direct marketing.

Corporate

Corporate operating expenses in the year ended December 31, 2018 were $88.3 million, an increase of $20.3 million compared to the same period in 2017. The increase was primarily driven by lower allocation recoveries, higher bad debt expense in 2018 due to a client-related bankruptcy and higher healthcare costs, partially offset by cost control initiatives. The following table summarizes unallocated operating expenses and certain items impacting comparability within the activities presented as Corporate:

	Year Ended December 31, 2018	2017
	(in millions)	
Operating expenses	$88.3	$68.0
Spinoff-related transaction expenses	—	3.3
Restructuring, impairment and other charges-net	9.1	9.9
Acquisition-related expenses	0.1	—

RESULTS OF OPERATIONS FOR THE YEAR ENDED DECEMBER 31, 2017 AS COMPARED TO THE YEAR ENDED DECEMBER 31, 2016

Consolidated

The following table shows the results of operations for continuing operations for the years ended December 31, 2017 and 2016, which reflects the results of acquired businesses from the relevant acquisition dates:

	Year Ended December 31, 2017	2016	$ Change	% Change
	(in millions, except percentages)			
Products net sales	$5,326.0	$5,225.4	$100.6	1.9 %
Services net sales	1,613.6	1,607.6	6.0	0.4 %

Total net sales	6,939.6	6,833.0	106.6	1.6	%
Products cost of sales (exclusive of depreciation and amortization)	4,264.1	4,125.3	138.8	3.4	%
Services cost of sales (exclusive of depreciation and amortization)	1,359.3	1,359.0	0.3	0.0	%
Total cost of sales	5,623.4	5,484.3	139.1	2.5	%
Products gross profit	1,061.9	1,100.1	(38.2)	(3.5	%)
Services gross profit	254.3	248.6	5.7	2.3	%
Total gross profit	1,316.2	1,348.7	(32.5)	(2.4	%)
Selling, general and administrative expenses (exclusive of depreciation and amortization)	860.4	897.0	(36.6)	(4.1	%)
Restructuring, impairment and other charges-net	53.0	584.3	(531.3)	(90.9	%)
Depreciation and amortization	191.4	204.2	(12.8)	(6.3	%)
Other operating income	—	(11.9)	11.9	nm	
Income (loss) from operations	$211.4	$(324.9)	$536.3	nm	

Net sales of products for the year ended December 31, 2017 increased $100.6 million, or 1.9%, to $5,326.0 million versus the same period in 2016, including an $8.0 million, or 0.2%, increase due to changes in foreign exchange rates. Net sales of products also increased due to higher volume in packaging, partially offset by lower volume in forms and price pressures.

Net sales from services for the year ended December 31, 2017 increased $6.0 million, or 0.4%, to $1,613.6 million versus the same period in 2016, including a $5.6 million, or 0.3%, decrease due to changes in foreign exchange rates. Net sales from services increased due to higher volume and increased fuel surcharges in logistics, partially offset by lower postage pass-through sales in logistics, lower volume in business process outsourcing and price pressures.

Products cost of sales increased $138.8 million, or 3.4%, for the year ended December 31, 2017 versus the same period in 2016, primarily due to higher volume in packaging, as well as cost inflation, including higher paper costs in our products in Asia, partially offset by lower volume in forms and cost control initiatives across the organization. As a percentage of net sales, products cost of sales increased 1.2% to 80.1% for the year ended December 31, 2017 versus the same period in 2016.

Services cost of sales increased $0.3 million for the year ended December 31, 2017 versus the same period in 2016 and were in line with the increase in net sales from services.

Products gross profit decreased $38.2 million to $1,061.9 million for the year ended December 31, 2017 versus the same period in 2016, primarily due to price pressures, cost inflation and lower volume in forms, partially offset by higher volume in packaging and cost control initiatives. Products gross margin decreased from 21.1% in 2016 to 19.9% in 2017.

Services gross profit increased $5.7 million to $254.3 million for the year ended December 31, 2017 versus the same period in 2016, due to increased fuel surcharges in logistics, partially offset by lower volume in business process outsourcing and price pressures. Services gross margin increased slightly from 15.5% to 15.8%.

Selling, general and administrative expenses decreased $36.6 million to $860.4 million for the year ended December 31, 2017 versus the same period in 2016. After including the unfavorable impact of foreign exchange rates of $13.4 million during the year ended December 31, 2017, selling, general and administrative expenses decreased due to lower bad debt, general consulting and legal expenses, lower corporate and other overhead costs and cost control initiatives. As a percentage of net sales, selling, general and administrative expenses decreased from 13.1% to 12.4% for the year ended December 31, 2017 versus the same period in 2016.

For the year ended December 31, 2017, we recorded net restructuring, impairment and other charges of $53.0 million, including $24.7 million for impairment and other charges, including MEPP withdrawal obligations, $23.5 million for employee termination costs and $4.8 million for lease termination and other restructuring charges. See Note 5, Restructuring, Impairment and Other Charges, to the Consolidated Financial Statements for further discussion.

Depreciation and amortization decreased $12.8 million to $191.4 million for the year ended December 31, 2017 compared to the same period in 2016 due to lower capital spending in recent years compared to historical levels and certain client relationship intangible assets becoming fully amortized.

Other operating income for the year ended December 31, 2016 was $11.9 million, which related primarily to the net gain on disposal of insignificant entities in the Business Services segment.

Income from operations for the year ended December 31, 2017 was $211.4 million, an increase of $536.3 million compared to the year ended December 31, 2016, which included an approximate $25.0 million unfavorable impact due to changes in foreign exchange rates.

	Year Ended December 31,			
	2017	2016	$ Change	% Change
	(in millions, except percentages)			
Interest expense-net	$179.6	$198.7	$ (19.1)	(9.6 %)

Investment and other income-net	(63.8)	(26.4)	(37.4)	nm
Loss on debt extinguishment	20.1	—	20.1	nm

Net interest expense decreased by $19.1 million for the year ended December 31, 2017 versus the same period in 2016 primarily due lower average borrowings during the year ended December 31, 2017.

Net investment and other income for the year ended December 31, 2017 was $63.8 million and included a non-cash net realized gain of $94.0 million on the retained shares of Donnelley Financial exchanged for certain of our senior notes outstanding, net pension and OPEB income and a gain of $1.3 million resulting from the sale of certain of our affordable housing investments, partially offset by a net realized loss of $51.6 million resulting from the sale of our retained shares of LSC. Net investment and other income for the year ended December 31, 2016 was $26.4 million and principally comprised of net pension and OPEB income.

Loss on debt extinguishments for the year ended December 31, 2017 was $20.1 million which related to premiums paid in connection with the tenders, unamortized debt issuance costs and other expenses associated with the debt-for-equity exchange of senior notes, the repurchase of debentures and senior notes and the amendment and restatement of the credit agreement. See Note 12, Debt, to the Consolidated Financial Statements for further discussion.

	Year Ended December 31,			
	2017	2016	$ Change	% Change
	(in millions, except percentages)			
Earnings (loss) before income taxes	$75.5	$(497.2)	$572.7	nm
Income tax expense (benefit)	108.7	(12.3)	121.0	nm
Effective income tax rate	144.0%	2.5%		

The effective income tax rate for the year ended December 31, 2017 was an expense of 144.0% compared to a benefit of 2.5% in the same period in 2016. The income tax expense for the year ended December 31, 2017 reflects the impact associated with the enactment of the Tax Act which included a provisional estimate for the one-time transition tax on foreign earnings of $103.5 million, as well as a provisional adjustment to the net deferred tax assets for the reduced corporate income tax rate of $6.8 million. The income tax expense also reflects non-deductible goodwill impairment charges, the inability to recognize a tax benefit on certain losses and the impact of the non-taxable gain on the sale of the Donnelley Financial retained shares. The sale of the LSC retained shares generated a capital loss which will be carried forward; however, it was determined at the time of the sale that the benefit of such deferred tax asset would not be fully realized and a valuation allowance was recorded. The tax rate in 2016 reflects the impact of the non-deductible goodwill impairment charges.

Income attributable to noncontrolling interests was $1.2 million and $1.3 million for the years ended December 31, 2017 and 2016, respectively.

Net loss from continuing operations for the year ended December 31, 2017 was $33.2 million compared to $484.9 million for the year ended December 31, 2016.

Information by Segment

Business Services

	Year Ended December 31,	
	2017	2016
	(in millions, except percentages)	
Net sales	$5,762.7	$5,681.1
Income (loss) from operations	248.6	(73.8)
Operating margin	4.3%	(1.3%)
Restructuring, impairment and other charges-net	17.8	400.9
Gain on disposal of businesses	—	(12.5)
Spinoff-related transaction expenses	—	0.1

Net sales for the Business Services segment for the year ended December 31, 2017 were $5,762.7 million, an increase of $81.6 million, or 1.4%, compared to 2016. Net sales increased primarily due to higher volume in packaging and favorable changes in foreign exchange rates, partially offset by lower volume in forms and price pressures. The following table summarizes net sales by products and services in the Business Services segment:

Products and Services	Year Ended December 31, 2017	2016	$ Change	% Change
	(in millions, except percentages)			
Commercial print	$2,114.0	$2,072.5	$ 41.5	2.0 %
Logistics	1,238.2	1,236.1	2.1	0.2 %
Packaging	562.1	459.3	102.8	22.4 %
Statements	556.4	561.3	(4.9)	(0.9 %)
Labels	470.4	472.1	(1.7)	(0.4 %)
Supply chain management	314.9	321.7	(6.8)	(2.1 %)
Forms	284.5	329.2	(44.7)	(13.6 %)
Business process outsourcing	222.2	228.9	(6.7)	(2.9 %)
Total Business Services	$5,762.7	$5,681.1	$ 81.6	1.4 %

Business Services segment had income from operations of $248.6 million for the year ended December 31, 2017 as compared to a loss from operations of $73.8 million for the year ended December 31, 2016. The income was primarily driven by lower net restructuring, impairment and other charges, higher volume in packaging and lower bad debt expense, partially offset by the prior year $12.5 million gain recognized on the sale of businesses, lower volume in forms, higher start-up expenses associated with the new packaging business in Asia, price pressures and higher performance-based compensation.

Marketing Solutions

	Year Ended December 31,		
	2017	2016	
	(in millions, except percentages)		
Net sales	$1,176.9	$1,151.9	
Income (loss) from operations	30.8	(99.4)	
Operating margin	2.6	%	(8.6)	%
Restructuring, impairment and other charges-net	25.3	173.0	

Net sales for the Marketing Solutions segment for the year ended December 31, 2017 were $1,176.9 million, an increase of $25.0 million, or 2.2%, compared to the year ended December 31, 2016. Net sales increased primarily due to incremental sales from the 2016 acquisition of Precision Dialogue, partially offset by price pressures. The following table summarizes net sales by products and services in the Marketing Solutions segment:

	Year Ended December 31,			
Products and Services	2017	2016	$ Change	% Change
	(in millions, except percentages)			
Direct marketing	$545.7	$537.4	$ 8.3	1.5 %
Digital print and fulfillment	478.0	471.9	6.1	1.3 %
Digital and creative solutions	153.2	142.6	10.6	7.4 %
Total Marketing Solutions	$1,176.9	$1,151.9	$ 25.0	2.2 %

Marketing Solutions segment income from operations increased $130.2 million for the year ended December 31, 2017, primarily due to lower net restructuring, impairment and other charges and incremental sales from the 2016 acquisition of Precision Dialogue, partially offset by price pressures.

Corporate

Corporate operating expenses in the year ended December 31, 2017 were $68.0 million, a decrease of $83.7 million versus the same period in 2016. The decrease was primarily driven by lower corporate and other overhead costs related to the pre-Separation combined entity, lower general consulting, legal and bad debt expenses, cost control initiatives and lower spinoff-related transaction expenses, partially offset by higher performance-based compensation. The following table summarizes unallocated operating expenses and certain items impacting comparability within the activities presented as Corporate:

	Year Ended December 31,	
	2017	2016
	(in millions)	
Operating expenses	$68.0	$151.7

Restructuring, impairment and other charges-net	9.9	10.4
Spinoff-related transaction expenses	3.3	7.9
Acquisition-related expenses	—	2.7
Loss on disposal of businesses	—	0.6

LIQUIDITY AND CAPITAL RESOURCES

We believe that we have sufficient liquidity to support our ongoing operations and to invest in future growth to create value for our stockholders. Operating cash flows and available capacity under our asset-based senior secured revolving credit facility (the "ABL Credit Agreement") are our primary sources of liquidity and are expected to be used for, among other things, capital expenditures necessary to support productivity improvement and growth, completion of restructuring programs, acquisitions, payment of interest and principal on our long-term debt obligations, and distributions to stockholders that require approval by the Board of Directors.

The following describes our cash flows for the years ended December 31, 2018, 2017 and 2016. Our cash flows for the period prior to the October 1, 2016 Distribution include the impact of LSC and Donnelley Financial. See Note 2, Discontinued Operations, to the Consolidated Financial Statements for information on the significant non-cash items, capital expenditures and depreciation and amortization related to LSC and Donnelley Financial.

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Net cash provided by operating activities	$203.5	$217.9	$127.2
Net cash (used in) provided by investing activities	(7.4)	24.7	(200.6)
Net cash (used in) provided by financing activities	(77.2)	(294.3)	19.9
Effect of exchange rates on cash, cash equivalents and restricted cash	(16.8)	17.3	(16.5)
Net increase (decrease) in cash, cash equivalents and restricted cash	$102.1	$(34.4)	$(70.0)

Cash Flows From Operating Activities

Operating cash inflows are largely attributable to sales of our products and services. Operating cash outflows are largely attributable to recurring expenditures for raw materials, labor, rent, interest, taxes and other operating activities. The year ended December 31, 2016 includes cash flows from discontinued operations.

Net cash provided by operating activities in 2018 was $14.4 million lower than in 2017, primarily driven by a reduction in operating income, including the sale of our Print Logistics business, partially offset by lower tax and interest payments.

Net cash provided by operating activities in 2017 was $90.7 million higher than in 2016, primarily driven by lower interest, spinoff-related transaction and tax payments, as well as other improvements in working capital.

Included in net cash provided by operating activities were the following operating cash (inflows) outflows:

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Income tax payments, net of tax refunds	$(15.2)	$2.8	$101.0
Interest payments, net of interest income	171.7	177.6	280.1

Cash Flows From Investing Activities

Net cash used in investing activities in 2018 was $7.4 million compared to an inflow of $24.7 million in 2017. The change in 2018 is driven primarily by a decrease in proceeds from sales of investments and other assets of $85.9 million, offset by net proceeds from the sale of our Print Logistics business of $43.9 million. See Note 3, Dispositions and Acquisition, to the Consolidated Financial Statements for further discussion on the sale of our Print Logistics business.

Net cash provided by investing activities in 2017 was $24.7 million compared to an outflow of $200.6 million in 2016. The change in 2017 is driven primarily by an increase in proceeds from sales of investments and other assets of $136.6 million, including $121.4 million from the sale of our retained interest in LSC and a decrease in capital expenditures of $63.6 million primarily related to LSC and Donnelley Financial capital expenditures of $49.0 million in 2016.

Cash Flows From Financing Activities

Net cash used in financing activities in 2018 was $217.1 million lower than in 2017, driven primarily by proceeds of $544.5 million from entering into the Term Loan Credit Agreement which we used to pay current maturities and

long-term debt of $460.7 million. See Note 12, Debt, to the Consolidated Financial Statements for further discussion. In 2017, we paid the final spinoff cash settlements totaling $78.0 million to LSC and Donnelley Financial as required by the Separation and Distribution agreement.

Net cash used in financing activities in 2017 was $294.3 million compared to an inflow of $19.9 million in 2016. The change in 2017 is driven primarily by the repurchase in 2017 of $201.6 million of certain senior notes and debentures outstanding with borrowings under the credit facilities.

Dividends

On January 17, 2019, our Board of Directors declared a quarterly cash dividend of $0.03 per common share, payable on March 1, 2019 to stockholders of record on February 15, 2019.

The ABL and Term Loan Credit Agreements generally allow annual dividend payments of up to $60.0 million in aggregate, though additional dividends may be allowed subject to certain conditions. Our Board of Directors must review and approve future dividend payments and will determine whether to declare additional dividends based on our operating performance, expected future cash flows, debt levels, liquidity needs and investment opportunities.

Significant cash inflows (outflows), excluding those related to operating activities, for each period were as follows:

	Year Ended December 31,		
	2018	2017	2016
	(in millions)		
Capital expenditures	$(104.4)	$(108.5)	$(172.1)
Acquisition of business, net of cash acquired	—	—	(48.1)
Disposition of businesses, net of cash disposed	44.1	—	13.7
Proceeds from sales of investments and other assets	54.5	140.4	3.8
Proceeds from issuance of long-term debt	544.5	—	1,164.0
Payments of current maturities and long-term debt	(460.7)	(201.6)	(1,013.2)
Net (payments) proceeds on credit facility borrowings	(157.0)	31.0	185.0
Dividends paid	(23.9)	(39.2)	(173.0)
Net transfer of cash, cash equivalents and restricted cash to LSC and Donnelley Financial	—	(78.0)	(85.9)

Contractual Cash Obligations and Other Commitments and Contingencies

The following table quantifies our future contractual obligations as of December 31, 2018:

	Payments Due In						
	Total	2019	2020	2021	2022	2023	Thereafter
	(in millions)						
Debt [a]	$2,113.7	$216.3	$71.4	$277.4	$204.5	$294.7	$1,049.4
Interest due on debt	696.2	143.1	129.2	115.6	99.6	94.7	114.0
Operating leases [b]	258.5	77.8	56.9	41.3	27.7	21.4	33.4
MEPP withdrawal obligations	76.8	6.6	6.6	6.6	6.6	6.6	43.8
Outsourced services	52.5	39.6	9.9	2.4	0.4	0.1	0.1
Transition tax	99.1	8.0	8.6	8.6	8.6	15.0	50.3
Pension and OPEB plan contributions [c]	8.0	8.0	—	—	—	—	—
Deferred compensation [d]	9.8	6.0	1.3	1.7	0.1	0.1	0.6
Other [e]	53.0	50.6	1.5	0.7	0.2	—	—
Total as of December 31, 2018	$3,367.6	$556.0	$285.4	$454.3	$347.7	$432.6	$1,291.6

(a) Excludes unamortized debt issuance costs of $16.3 million and a discount of $5.9 million which do not represent contractual commitments with a fixed amount or maturity date.

(b) Includes executory costs such as taxes, maintenance and other operating expenses in connection with the leased properties.

(c) Includes the low-end of the estimated range for 2019 pension and OPEB plan contributions and does not include the obligations for subsequent periods, as we are unable to reasonably estimate the ultimate amounts.

(d) Excludes deferred compensation plans that are funded with investments.

(e) Represents contractual obligations for purchases of property, plant and equipment of $45.0 million and employee restructuring-related severance payments of $4.8 million. Excluded from the table are $24.9 million of uncertain tax liabilities, as we are unable to reasonably estimate the ultimate amount or timing of settlement or other resolution.

Liquidity

We maintain cash pooling structures that enable participating international locations to draw on our international cash resources to meet local liquidity needs. Foreign cash balances may be loaned from certain cash pools to U.S. operating entities on a temporary basis in order to reduce our short-term borrowing costs or for other purposes.

Cash and cash equivalents were $370.6 million as of December 31, 2018, an increase of $97.2 million compared to December 31, 2017.

Our cash balances are held in numerous locations throughout the world, including substantial amounts held outside of the United States. Cash and cash equivalents as of December 31, 2018 included $44.2 million in the U.S. and $326.4 million at international locations. We have recognized deferred tax liabilities of $6.5 million as of December 31, 2018 related to local taxes on certain foreign earnings that are not considered to be permanently reinvested. Certain other cash balances of foreign subsidiaries, if repatriated to the U.S., may be subject to additional tax which would depend on income tax laws and circumstances at the time of distribution. In addition, repatriation of some foreign cash balances is further restricted by local laws. We regularly evaluate whether foreign earnings are expected to be permanently reinvested. This evaluation requires judgment about our future operating and liquidity needs. Changes in economic and business conditions, foreign or U.S. tax laws, or our financial situation could result in changes to these judgments and the need to record additional tax liabilities.

Included in cash and cash equivalents at December 31, 2018 were $27.6 million of short-term investments, which primarily consisted of short-term deposits and money market funds. These investments are held with institutions with sound credit ratings and are expected to be highly liquid.

In March 2017, we sold the 6.2 million common shares we retained upon the spinoff of LSC for net proceeds of $121.4 million. The proceeds of this sale were used to repay a portion of the outstanding borrowings under our then-existing credit facility. In June 2017, we exchanged 6.1 million of the 6.2 million common shares of Donnelley Financial retained upon the spinoff for $111.6 million of aggregate principal of certain outstanding senior notes. In August 2017, we disposed of our remaining retained shares in Donnelley Financial via a second debt-for-equity exchange, pursuant to which we exchanged 0.1 million shares of Donnelley Financial's common stock for $1.9 million of aggregate principal of certain outstanding senior notes. Such debt obligations were cancelled and discharged upon delivery to us.

On September 29, 2017, we entered into an asset-based revolving credit facility (the "ABL Credit Agreement") which amended and restated our prior $800.0 million senior secured revolving credit facility dated September 30, 2016. The ABL Credit Agreement provides for a senior secured asset-based revolving credit facility of up to $800.0 million. The amount available to be borrowed under the ABL Credit Agreement is equal to the lesser of (a) $800.0 million and (b) a borrowing base formula based on the amount of accounts receivable, inventory, machinery, equipment and, if we were to so elect in the future subject to the satisfaction of certain conditions, fee-owned real estate of ours and our material domestic subsidiaries that are guarantors under the ABL Credit Agreement (the "Guarantors"), subject to certain eligibility criteria and advance rates (collectively, the "Borrowing Base"). The aggregate amount of real estate, machinery and equipment that can be included in the Borrowing Base cannot exceed $200.0 million.

Our obligations under the ABL Credit Agreement are guaranteed by the Guarantors and are secured by a security interest in substantially all assets of ours and the Guarantors, including, only to the extent included in the Borrowing Base, real property, in each case subject to certain exceptions and exclusions. The assets of ours and the Guarantors consisting of accounts receivable, inventory, deposit accounts, securities accounts, machinery and equipment and, to the extent related to the foregoing, general intangibles, documents and instruments, as well as 65% of the equity interests of our first-tier foreign subsidiaries (collectively, the "ABL Priority Collateral"), secure our obligations and the obligations of the Guarantors under the ABL Credit Agreement and the related guarantees on a first-priority basis, and all other collateral other than the ABL Priority Collateral secures our obligations and the obligations of the Guarantors under the ABL Credit Agreement on a second-priority basis, in each case, subject to permitted liens.

The ABL Credit Agreement contains customary restrictive covenants, including a covenant which requires us to maintain a minimum fixed charge coverage ratio under certain circumstances. In addition, our ability to undertake certain actions, including, among other things, prepay certain junior debt, incur additional unsecured indebtedness and make certain restricted payments depends on satisfaction of certain conditions, including, among other things, meeting minimum borrowing availability thresholds under the ABL Credit Agreement.

Borrowings under the ABL Credit Agreement bear interest at a rate dependent on the average quarterly availability under the ABL Credit Agreement and is calculated according to a base rate (except in certain circumstances, based on the prime rate) or a Eurocurrency rate (except in certain circumstances, based on LIBOR) plus an applicable margin. The applicable margin for base rate loans ranges from 0.25% to 0.50% and the applicable margin for Eurocurrency loans ranges from 1.25% to 1.50%. In addition, a fee is payable quarterly on the unused portion of the amount available to be borrowed under the ABL Credit Agreement. The fee accrues at a rate of either 0.25% or 0.375% depending upon the average usage of the facility.

The ABL Credit Agreement is scheduled to mature on September 29, 2022, at which time all outstanding amounts under the ABL Credit Agreement will be due and payable. Borrowings under the ABL Credit Agreement may be used

for working capital and general corporate purposes.

There were $59.0 million of borrowings under the ABL Credit Agreement as of December 31, 2018. Based on our borrowing base as of December 31, 2018 and existing borrowings, including a debt maturity reserve for the $172.2 million 11.25% senior notes due February 1, 2019, we had approximately $524.0 million borrowing capacity available under the ABL Credit Agreement.

The current availability under the ABL Credit Agreement as of December 31, 2018 is shown in the table below:

Availability	December 31, 2018 (in millions)
ABL Credit Agreement	$ 800.0
Availability reduction due to available borrowing base	10.6
Debt maturity reserve[(a)]	172.2
	$ 617.2
Usage	
Borrowings under the ABL Credit Agreement	59.0
Outstanding letters of credit	34.2
	$ 93.2
Current availability at December 31, 2018	$ 524.0
Cash and cash equivalents	370.6
Total available liquidity[(b)]	$ 894.6

(a) On February 1, 2019, we retired the $172.2 million 11.25% senior notes using availability under the ABL Credit Agreement.

(b) Total available liquidity does not include credit facilities of non-U.S. subsidiaries, which are uncommitted facilities.

As of December 31, 2018, we were in compliance with the debt covenants under the ABL Credit Agreement and expect to remain in compliance based on our estimates of operating and financial results for 2019 and the foreseeable future. As of December 31, 2018, we met all the conditions required to borrow under the ABL Credit Agreement and we expect to continue to meet the applicable borrowing conditions.

The failure of a financial institution supporting the ABL Credit Agreement would reduce the size of our committed facility unless a replacement institution was added. Currently, the ABL Credit Agreement is supported by eight U.S. financial institutions.

As of December 31, 2018, we had $179.8 million in other uncommitted credit facilities, primarily outside the U.S. (the “Other Facilities”). There were $111.2 million in outstanding letters of credit, bank guarantees and bank acceptance drafts which reduced availability, of which $34.2 million were issued under the ABL Credit Agreement. Total borrowings under the ABL Credit Agreement and the Other Facilities (the “Combined Facilities”) were $97.3 million and $226.6 million as of December 31, 2018 and 2017, respectively.

Our liquidity may be affected by our credit ratings. During the first quarter of 2018, Moody’s Investors Service, Inc. (“Moody’s”) downgraded our long-term corporate credit rating from B1 to B2 and downgraded the senior unsecured debt credit rating from B2 to B3. The outlook remained stable. During the third quarter of 2018, S&P Global Ratings (“S&P”) affirmed our long-term credit rating but revised the outlook from stable to negative and lowered the credit ratings on the senior unsecured debt from B to B-. Our S&P and Moody’s credit ratings as of December 31, 2018 are shown in the table below:

	S&P	Moody's
Long-term corporate credit rating	B, Neg	B2, Stable

Senior unsecured debt	B-	B3
Term Loan Credit Agreement	B+	B1

Dispositions and Acquisition

During the year ended December 31 2018, we sold our Print Logistics business within the Business Services segment for net proceeds of $43.9 million.

During the year ended December 31, 2016, we paid $48.1 million, net of cash acquired, for the acquisition of Precision Dialogue. We financed the cash portion of the acquisition with a combination of cash on hand and borrowings under the then-existing credit facility. Additionally, during the year ended December 31, 2016, we disposed of insignificant entities within the Business Services segment for net proceeds of $13.7 million.

Debt Issuances

On October 15, 2018, we entered into a $550.0 million senior secured Term Loan B credit facility pursuant to a credit agreement (the “Term Loan Credit Agreement”). Proceeds from the Term Loan Credit Agreement, net of a $5.5 million discount, were used to repurchase certain senior notes, pay transaction fees and repay a portion of borrowings under the ABL Credit Agreement.

Our obligations under the Term Loan Credit Agreement are guaranteed by the Guarantors and are secured by a security interest in substantially all assets of ours and the Guarantors, including certain material real property, subject to certain exceptions and exclusions. The ABL Priority Collateral secures our obligations and the obligations of the Guarantors under the Term Loan Credit Agreement and related guarantees on a second-priority basis, and all other collateral other than the ABL Priority Collateral secures our obligations and the obligations of the Guarantors under the Term Loan Credit Agreement and related guarantees on a first-priority basis, in each case, subject to permitted liens.

The Term Loan Credit Agreement contains customary affirmative and negative covenants including negative covenants restricting, among other things, our ability to incur debt, make investments, make certain restricted payments (including payments on certain other debt), incur liens securing other debt, consummate certain fundamental transactions, enter into transactions with affiliates and consummate asset sales. The Term Loan Credit Agreement requires that the net cash proceeds of significant asset sales be used to prepay borrowings under the Term Loan Credit Agreement, except in certain circumstances, including the reinvestment of net cash proceeds in assets useful to our business, repayment of borrowings under our ABL Credit Agreement or the funding of debt tenders, in each case, subject to certain restrictions and limitations set forth in the Term Loan Credit Agreement.

The Term Loan Credit Agreement is scheduled to mature on January 15, 2024, at which time all amounts outstanding under the Term Loan Credit Agreement will be due and payable. Principal payments of $1.4 million are due quarterly beginning at the end of the first quarter in 2019. Borrowings will bear interest at a Eurocurrency rate plus a margin of 5% or a base rate plus a margin of 4%.

On October 15, 2018, we repurchased $172.6 million and $257.4 million in aggregate principal amount of the 7.625% senior notes due 2020 and 7.875% senior notes due 2021, respectively, pursuant to a tender offer. We recorded a loss on debt extinguishment of $32.3 million in the fourth quarter of 2018 on the repurchase of the bonds, representing tender premiums paid of $29.0 million, write-off of unamortized debt issuance costs of $1.5 million and fees and expenses of $1.8 million.

On October 15, 2018, we entered into Amendment No. 1 to the ABL Credit Agreement, which amended the ABL Credit Agreement to, among other things, permit (i) the incurrence of the debt pursuant to the Term Loan Credit Agreement and (ii) the incurrence of a lien on the ABL Priority Collateral to secure our obligations under the Term Loan Credit Agreement and related guarantees on a second-priority basis.

During the fourth quarter of 2017, we entered into an agreement to sell a printing facility in Shenzhen, China and transfer the related land use rights. During 2018 and 2017, we received non-refundable deposits in accordance with the terms of the agreement of approximately $32.1 million and $12.5 million, respectively, which are recorded in Other noncurrent liabilities on the Consolidated Balance Sheets. Additional deposits will be paid to us in accordance with the agreement. Based on the current exchange rate, gross proceeds from the sale, including non-refundable deposits, are expected to be approximately $250.0 million and we expect the transaction to close in 2020 after closing conditions are satisfied and government approvals are obtained. As of December 31, 2018, we continue to classify the carrying cost of the building within property, plant and equipment and record depreciation expense. The carrying cost of the land use rights are classified in Other noncurrent assets and we continue to record amortization expense. The combined carrying cost of the building and land use rights is not significant.

Off-Balance Sheet Arrangements

Other than non-cancelable operating lease commitments, we do not have off-balance sheet arrangements, financings or special purpose entities.

Critical Accounting Policies and Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Our most critical accounting policies are those that are most important to the portrayal of our financial condition and results of operations, and which require us to make our most difficult and subjective judgments, often as a result of the need to make estimates of matters that are inherently uncertain. We have identified the following as our most critical accounting policies and judgments. Although we believe that our estimates and assumptions are reasonable, they are based upon information available when they are made, and therefore, actual results may differ from these estimates under different assumptions or conditions.

Revenue Recognition

On January 1, 2018, we adopted ASC Topic 606, “Revenue from Contracts with Customers” using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period amounts are not adjusted and continue to be reported in accordance with our historical accounting under Topic 605. All revenue recognized in the Consolidated Statements of Operations is considered to be revenue from contracts with clients.

Our products revenue is primarily recognized at a point in time. We generally recognize revenue for products upon the transfer of control of the products to the client which typically occurs upon transfer of title and risk of ownership, which is generally upon shipment to the client. For certain products, we are able to recognize revenue for completed inventory billed but not yet shipped at the client's direction.

Our services revenue is recognized both at a point in time as well as over time. Our logistics revenue is primarily recognized over time as the performance obligation is completed. Due to the short transit period of logistics performance obligations, the timing of revenue recognition does not require significant judgment. Our business process outsourcing and digital and creative solutions revenue is recognized over time or at a point in time, depending on the nature of the service which could be either recurring or project-based.

Goodwill and Other Long-Lived Assets

Our methodology for allocating the purchase price of acquisitions is based on established valuation techniques, and when appropriate, includes valuations performed by management or third-party appraisers. Based on our current organization structure, we have identified 14 reporting units for which cash flows are determinable and to which goodwill may be allocated. Goodwill is either assigned to a specific reporting unit or allocated between reporting units based on the relative excess fair value of each reporting unit.

We perform our goodwill impairment tests annually as of October 31 or more frequently if an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying value, indicating a possible impairment may exist.

As of October 31, 2018, seven reporting units had goodwill. The commercial print, digital print and fulfillment, forms, digital and creative solutions, business process outsourcing, Latin America and Canada reporting units had no goodwill as of October 31, 2018. As of January 1, 2017, we early adopted Accounting Standards Update 2017-04 (See Note 18, New Accounting Pronouncements, to the Consolidated Financial Statements), which eliminated the two step approach from the current goodwill impairment test and allows impairment to be calculated based on the results of the first step. In the impairment test for goodwill, the estimated fair value of each reporting unit is compared to its carrying value, including goodwill. If the carrying value of a reporting unit exceeds the estimated fair value, an impairment loss is recognized equal to the excess, limited to the total amount of goodwill allocated to that reporting unit.

Qualitative Assessment for Impairment

For two reporting units with goodwill, we performed a qualitative assessment to determine whether it was more likely than not that the fair values of the reporting units were less than their carrying values. In performing this analysis, we considered various factors, including the effect of market or industry changes and the reporting units' actual results compared to projected results. In addition, we considered how other key assumptions used in the October 31, 2017 annual goodwill impairment test could be impacted by changes in market conditions and economic events.

As part of the qualitative review of impairment, we analyzed the potential changes in fair values of the reporting units based on their operating results for the ten months ended October 31, 2018 compared to expected results. As of October 31, 2017, the estimated fair values of the reporting units exceeded their carrying values, according to a valuation performed by a third-party appraisal firm. Based on our qualitative assessment, we concluded that as of October 31, 2018, it was more likely than not that the fair values of the reporting units were greater than their carrying values.

Quantitative Assessment for Impairment

For the remaining five reporting units with goodwill, we compare the estimated fair value of each reporting unit to its carrying value, including goodwill. If the carrying value of a reporting unit exceeds the estimated fair value then the goodwill is reduced by the excess of carrying value over fair value. As part of our impairment test for these reporting units, we engaged a third-party appraisal firm to assist in our determination of the estimated fair values. This determination included estimating the fair value of each reporting unit using both income and market-based approaches. The income approach requires management to estimate a number of factors for each reporting unit, including projected future operating results, economic projections, anticipated future cash flows, discount rates and the allocation of shared or corporate items. The market approach estimates fair value using comparable marketplace fair value data from within a comparable industry grouping. We weighted both the income and market approach equally to estimate the concluded fair value of each reporting unit. As of October 31, 2018, the estimated fair values for each of our reporting units with goodwill exceeded their respective carrying values.

Goodwill Impairment Assumptions

Although we believe our estimates of fair value are reasonable, actual financial results could differ materially from those estimates due to the inherent uncertainty involved in making such estimates. Changes in assumptions concerning future financial results or other underlying assumptions could have a material impact on either the fair value of the reporting units, the amount of the goodwill impairment charge, or both. Future declines in the overall market value of our equity and debt securities may also result in a conclusion that the fair value of one or more reporting units has declined below its carrying value.

One measure of the sensitivity of the amount of goodwill impairment charges to key assumptions is the amount by which each reporting unit "passed" (fair value exceeds the carrying value) or "failed" (the carrying value exceeds fair value) the goodwill impairment test. All reporting units passed the goodwill impairment test performed by us during the fourth quarter of 2018 with fair values exceeding the carrying values by at least 20%. Relatively small changes in our key assumptions would not have resulted in any reporting units failing the goodwill impairment test.

Generally, changes in estimates of expected future cash flows would have a similar effect on the estimated fair value of the reporting unit. For example, a 1.0% decrease in estimated annual future cash flows would decrease the estimated fair value of the reporting unit by approximately 1.0%. The estimated long-term net sales growth rate can have a significant impact on the estimated future cash flows, and therefore, the fair value of each reporting unit. A 1.0% decrease in the long-term net sales growth rate would have resulted in no reporting units failing the goodwill impairment test. Of the other key assumptions that impact the estimated fair values, most reporting units have the greatest sensitivity to changes in the estimated discount rate. The estimated discount rates for the reporting units with operations primarily located in the U.S. were 10.5% and 11.0% as of October 31, 2018. The estimated discount rates for the two reporting units with operations primarily in foreign locations were 12.0% and 13.5% as of October 31, 2018. A 1.0% increase in estimated discount rates would have resulted in no reporting units failing the goodwill impairment test. We believe that our estimates of future cash flows and discount rates are reasonable, but future changes in the underlying assumptions could differ due to the inherent uncertainty in making such estimates. Additionally, further price deterioration or lower volume could have a material effect on the fair values of the reporting units.

Other Long-Lived Assets

We evaluate the recoverability of other long-lived assets, including property, plant and equipment and certain identifiable intangible assets, whenever events or changes in circumstances indicate that the carrying value of an asset or asset group may not be recoverable. Factors which could trigger an impairment review include significant underperformance relative to historical or projected future operating results, significant changes in the manner of use of the assets or the strategy for the overall business, a significant decrease in the market value of the assets or significant negative industry or economic trends. When we determine that the carrying value of long-lived assets may not be recoverable based upon the existence of one or more of the indicators, the assets are assessed for impairment based on the estimated future undiscounted cash flows expected to result from the use of the asset and its eventual disposition. If the carrying value of an asset exceeds its estimated future undiscounted cash flows, an impairment loss is recorded for the excess of the asset's carrying value over its fair value. During the year ended December 31, 2018, we recognized $13.9 million of impairment charges of other long-lived assets.

Pension and OPEB Plans

We record annual income and expense amounts relating to our pension and OPEB plans based on calculations which include various actuarial assumptions including discount rates, expected long-term rates of return, turnover rates, health care cost trend rates and compensation increases. We review our actuarial assumptions on an annual basis as of

December 31 (or more frequently if a significant event requiring remeasurement occurs) and modify the assumptions based on current rates and trends when it is appropriate to do so. The effects of modifications are recognized immediately on the Consolidated Balance Sheet, but are generally amortized into operating results over future periods, with the deferred amount recorded in accumulated other comprehensive income (loss). We believe that the assumptions utilized in recording our obligations under our plans are reasonable based on our experience, market conditions and input from our actuaries and investment advisors. The discount rates for pension benefits at December 31, 2018 and 2017 were 4.0% and 3.4%, respectively. The discount rates for OPEB plans were 4.2% and 3.5% at December 31, 2018 and 2017, respectively.

We use the full yield curve approach in the estimation of the interest components of net pension and OPEB plan expense (income) by applying the specific spot rates along the yield curve used in the determination of the projected benefit obligation to the relevant projected cash flows.

A one-percentage point change in the discount rates at December 31, 2018 would have the following effects on the accumulated benefit obligation and projected benefit obligation:

Pension Plans

	1.0% Increase	1.0% Decrease
	(in millions)	
Accumulated benefit obligation	$(110.3)	$ 136.7
Projected benefit obligation	(111.5)	138.3

OPEB

	1.0% Increase	1.0% Decrease
	(in millions)	
Accumulated benefit obligation	$(21.6)	$ 25.1

The majority of our pension plans are frozen and we have transitioned to a risk management approach for our U.S. pension plan assets. The overall investment objective of this approach is to further reduce the risk of significant decreases in the plan's funded status by allocating a larger portion of the plan's assets to investments expected to hedge the impact of interest rate risks on the plan's obligation. Over time, the target asset allocation percentage for the pension plan is expected to decrease for equity and other "return seeking" investments and increase for fixed income and other "hedging" investments. The assumed long-term rate of return for plan assets, which is determined annually, is likely to decrease as the asset allocation shifts over time.

The expected long-term rate of return for plan assets is based upon many factors including expected asset allocations, historical asset returns, current and expected future market conditions and risk. In addition, we considered the impact of the current interest rate environment on the expected long-term rate of return for certain asset classes, particularly fixed income. The target asset allocation percentage for the primary U.S. pension plan was approximately 50.0% for return seeking investments and approximately 50.0% for hedging investments. The expected long-term rate of return on plan assets assumption used to calculate net pension and OPEB plan expense in 2018 was 6.75% for both of our major U.S. pension and OPEB plans. The expected long-term rates of return on plan assets assumption that will be used to calculate net pension and OPEB plan expense (income) in 2019 are 6.25% and 6.50% for our major U.S. pension and OPEB plans, respectively.

A 0.25% change in the expected long-term rate of return on plan assets at December 31, 2018 would have the following effects on 2019 pension and OPEB plan (income)/expense:

	0.25% Increase	0.25% Decrease
	(in millions)	

U.S. pension plans	$(1.3)	$ 1.3
OPEB	(0.5)	0.5

We also maintain several pension plans in international locations. The expected returns on plan assets and discount rates for those plans are determined based on each plan's investment approach, local interest rates and plan participant profiles.

Accounting for Income Taxes

Significant judgment is required in determining the provision for income taxes and related accruals, deferred tax assets and liabilities and any valuation allowances recorded against deferred tax assets. In the ordinary course of business, there are transactions and calculations where the ultimate tax outcome is uncertain. Additionally, our tax returns are subject to audit by various U.S. and foreign tax authorities. We recognize a tax position in our financial statements when it is more likely than not (i.e., a likelihood of more than fifty percent) that the position would be sustained upon examination by tax authorities. This recognized tax position is then measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. Although we believe that our estimates are reasonable, the final outcome of uncertain tax positions may be materially different from that which is reflected in our historical financial statements.

We have recorded deferred tax assets related to future deductible items, including domestic and foreign tax loss and credit carryforwards. We evaluate these deferred tax assets by tax jurisdiction. The utilization of these tax assets is limited by the amount of taxable income expected to be generated within the allowable carryforward period and other factors. Accordingly, we have recorded a valuation allowance to reduce certain of these deferred tax assets when we have concluded that, based on the weight of available evidence, it is more likely than not that the deferred tax assets will not be fully realized. If actual results differ from these estimates, or the estimates are adjusted in future periods, adjustments to the valuation allowance might need to be recorded. As of December 31, 2018 and 2017, valuation allowances of $255.9 million and $238.3 million, respectively, were recorded in our Consolidated Balance Sheets.

The Tax Act was signed into law on December 22, 2017 and represents the most significant change to U.S. tax law since 1986. Key changes of the Tax Act are not limited to, but include the following: reduces the U.S. federal statutory rate from 35% to 21%; creates a territorial tax system rather than a worldwide system, generally allowing companies to repatriate future foreign-sourced earnings without incurring additional U.S. taxes; subjects certain foreign earnings on which U.S. income tax is currently deferred to a one-time transition tax; provides for new anti-deferral provisions to tax certain foreign earnings and a new base erosion tax; limits the deduction for net interest expense incurred by U.S. Companies; and eliminates or reduces certain other deductions.

Also on December 22, 2017, the SEC issued Staff Accounting Bulletin 118 (SAB 118) which provides guidance for companies analyzing their accounting for the income tax effects of the Tax Act. SAB 118 provides that a company may report provisional amounts based on reasonable estimates. The provisional estimates are then subject to adjustment during a measurement period up to one year and should be accounted for as a prospective change.

During 2017, we recorded provisional estimates of the impact of the Tax Act within our income tax expense. To determine the amount of the transition tax, we were required to quantify, among other factors, the amount of post-1986 earnings and profits of applicable foreign subsidiaries, the amount of non-U.S. tax paid on those earnings, as well as limitations of foreign tax credits. During 2018, we continued to analyze and interpret new guidance and clarifications of the Tax Act, and as a result recorded adjustments to the provisional estimates. During the fourth quarter of 2018, we finalized our accounting analysis for the income tax effects of the Tax Act. However, in the future, we may be subject to additional taxes as required under the Tax Act, based upon new regulations and guidance which may adversely affect our results of operations, financial position and cash flows.

Deferred U.S. income taxes and foreign taxes have historically not been provided on the excess of the investment value for financial reporting over the tax basis of investments in those foreign subsidiaries for which such excess is considered to be permanently reinvested in those operations.

In January 2018, the FASB released guidance on the accounting for tax on the global intangible low-taxed income ("GILTI") provisions in the Tax Act. The GILTI provisions impose a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The guidance indicates that either accounting for deferred taxes related to GILTI inclusions or treating any taxes on GILTI inclusions as period cost are both acceptable methods subject to an accounting policy election. During the fourth quarter of 2018, we elected to treat the tax effect of GILTI as a current-period expense when incurred.

See Note 11, Income Taxes, to the Consolidated Financial Statements for further discussion.

Management of Market Risk

We are exposed to interest rate risk on our variable debt and price risk on our fixed-rate debt. At December 31, 2018, our variable-interest borrowings were $647.3 million. Approximately 69% of our outstanding debt was comprised of fixed-rate debt as of December 31, 2018.

We assess market risk based on changes in interest rates utilizing a sensitivity analysis that measures the potential loss in earnings, fair values and cash flows based on a hypothetical 10% change in interest rates. Using this sensitivity analysis, such changes would not have a material effect on interest income or expense and cash flows and would change the fair values of fixed-rate debt at December 31, 2018 and 2017 by approximately $35.4 million and $48.9 million, respectively.

We are exposed to the impact of foreign currency fluctuations in certain countries in which we operate. The exposure to foreign currency movements is limited in many countries because the operating revenues and expenses of our

various subsidiaries and business units are substantially in the local currency of the country in which they operate. To the extent that borrowings, sales, purchases, revenues, expenses or other transactions are not in the local currency of the subsidiary, we are exposed to currency risk and may enter into foreign exchange contracts to hedge the currency risk. As of December 31, 2018 and 2017, the aggregate notional amount of outstanding foreign currency contracts was $170.8 million and $215.9 million, respectively (see Note 13, Derivatives, to the Consolidated Financial Statements). The net unrealized gains from these foreign currency contracts were $0.6 million and $2.2 million at December 31, 2018 and 2017, respectively. We do not use derivative financial instruments for trading or speculative purposes.

OTHER INFORMATION

Environmental, Health and Safety

For a discussion of certain environmental, health and safety issues involving us, see Note 9, Commitments and Contingencies, to the Consolidated Financial Statements.

Litigation and Contingent Liabilities

For a discussion of certain litigation involving us, see Note 9, Commitments and Contingencies, to the Consolidated Financial Statements.

New Accounting Pronouncements

Recently issued accounting standards and their estimated effect on our Consolidated Financial Statements are also described in Note 18, New Accounting Pronouncements, to the Consolidated Financial Statements.

ITEM 7A.QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Market Risk

We are exposed to interest rate risk on our variable-rate debt, price risk on our fixed-rate debt and the impact of foreign currency fluctuations in certain countries in which we operate. We discuss risk management in various places throughout this document, including discussions in Item 7 of Part II of this Annual Report on Form 10-K concerning Liquidity and Capital Resources and in Note 13, Derivatives, to Consolidated Financial Statements.

Credit Risk

We are exposed to credit risk on accounts receivable balances. This risk is mitigated due to our large, diverse client base, dispersed over various geographic regions and industrial sectors. No single client comprised more than 10% of our consolidated net sales in 2018, 2017 or 2016. We maintain provisions for potential credit losses and such losses to date have normally been within our expectations. We evaluate the solvency of our clients on an ongoing basis to determine if additional allowances for doubtful accounts receivable need to be recorded. Significant economic disruptions or a slowdown in the economy could result in significant additional charges.

Commodities

The primary raw materials used by us are paper and ink. To reduce price risk caused by market fluctuations, we have incorporated price adjustment clauses in certain sales contracts. We believe a hypothetical 10% change in the price of paper and other raw materials would not have a significant effect on our consolidated annual results of operations or cash flows because these costs are generally passed through to our clients, although there may be contractual delays in our ability to pass along these increases.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA
The financial information required by Item 8 is contained in Item 15 of Part IV of this Annual Report on Form 10-K.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE
None.

ITEM 9A. CONTROLS AND PROCEDURES
Disclosure Controls and Procedures

As required by Rule 13a-15(b) and Rule 15d-15(e) of the Securities Exchange Act of 1934, our management, including the Chief Executive Officer and Chief Financial Officer, is responsible for establishing and maintaining effective disclosure controls and procedures, as defined under Rules 13a-15(e) and 15d-15(e) of the Securities

Exchange Act of 1934. As of December 31, 2018, an evaluation was performed under the supervision and with the participation of management, including the Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that disclosure controls and procedures as of December 31, 2018 were effective in ensuring information required to be disclosed in our SEC reports was recorded, processed, summarized, and reported within the time periods specified in the SEC's rules and forms, and that such information was accumulated and communicated to management, including the Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934) that occurred during the quarter ended December 31, 2018 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Report of Management on Internal Control Over Financial Reporting

The management of the Company, including the Company's Chief Executive Officer and Chief Financial Officer, is responsible for establishing and maintaining adequate internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934).

Management of the Company, including the Company's Chief Executive Officer and Chief Financial Officer, assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2018. Management based this assessment on criteria for effective internal control over financial reporting described in the "Internal Control—Integrated Framework (2013)" issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Based on this assessment, management determined that, as of December 31, 2018, the Company maintained effective internal control over financial reporting.

Deloitte & Touche LLP, an independent registered public accounting firm, who audited the consolidated financial statements of the Company included in this Annual Report on Form 10-K , has also audited the effectiveness of the Company's internal control over financial reporting as stated in its report appearing below.

February 27, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of

R.R. Donnelley & Sons Company

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of R.R. Donnelley & Sons Company and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2018 of the Company and our report dated February 27, 2019 expressed an unqualified opinion on those financial statements.

Basis for Opinion

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

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

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/ DELOITTE & TOUCHE LLP

Chicago, Illinois

February 27, 2019

ITEM 9B. OTHER INFORMATION
None.

PART III

ITEM 10. DIRECTORS AND EXECUTIVE OFFICERS OF R.R. DONNELLEY & SONS COMPANY AND CORPORATE GOVERNANCE
Information regarding our directors and executive officers is incorporated herein by reference to the descriptions under “Proposal 1: Election of Directors,” “The Board’s Committees and their Functions” and “Section 16(a) Beneficial Ownership Reporting Compliance” of our Proxy Statement for the Annual Meeting of Stockholders scheduled to be held May 16, 2019 (the “2019 Proxy Statement”). See also the information with respect to our executive officers at the end of Part I of this Annual Report on Form 10-K under the caption “Executive Officers of R.R. Donnelley & Sons Company.”

We have adopted a policy statement entitled Code of Ethics that applies to our chief executive officer and senior financial officers which we make available on our web site, www.rrd.com. In the event that an amendment to, or a waiver from, a provision of the Code of Ethics is made or granted, we intend to post such information on our web site.

ITEM 11. EXECUTIVE COMPENSATION
Information regarding executive and director compensation is incorporated by reference to the material under the captions “Compensation Discussion and Analysis,” “Human Resources Committee Report,” “Executive Compensation,” “Potential Payments Upon Termination or Change in Control,” and “Director Compensation” of the 2019 Proxy Statement.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS
Information regarding security ownership of certain beneficial owners and management is incorporated herein by reference to the material under the heading “Stock Ownership” of the 2019 Proxy Statement.

Equity Compensation Plan Information

Information as of December 31, 2018 concerning compensation plans under which our equity securities are authorized for issuance was as follows:

Equity Compensation Plan Information

Plan Category	Number of Securities to Be Issued upon Exercise of	Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights [b]	Number of Securities Remaining Available for Future Issuance under Equity Compensation Plans (Excluding Securities

	Outstanding Options, Warrants and Rights (in thousands) (1)	(2)	Reflected in Column (1)) (in thousands) (3)
Equity compensation plans approved by security holders [a]	3,268.7	$ 22.95	1,229.5[c]

(a) Includes 2,529,953 shares issuable upon the vesting of restricted stock units.

(b) Restricted stock units were excluded when determining the weighted-average exercise price of outstanding options, warrants and rights.

(c) All of these shares are available for issuance under the 2017 Performance Incentive Plan. The 2012 Performance Incentive Plan (the "2012 PIP"), which was frozen effective May 18, 2017, allowed grants in the form of cash or bonus awards, stock options, stock appreciation rights, restricted stock, stock units or combinations thereof. The maximum number of shares of common stock that could have been granted under the 2012 PIP with respect to bonus awards, including performance awards or fixed awards in the form of restricted stock or other form, was 10,000,000 in the aggregate, or 3,333,333 adjusted for the stock split. The 2017 Performance Incentive Plan (the "2017 PIP") allows grants in the form of cash or bonus awards, stock options, stock appreciation rights, restricted stock, stock units or combinations thereof. The maximum number of shares of common stock that may be granted under the 2017 PIP with respect to bonus awards, including performance awards or fixed awards in the form of restricted stock or other form, is 3,225,000 in the aggregate, of which 1,229,533 remained available for issuance as of December 31, 2018.

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS AND DIRECTOR INDEPENDENCE

Information regarding certain relationships and related transactions and director independence is incorporated herein by reference to the material under the heading “Certain Transactions,” “The Board’s Committees and Their Functions” and “Corporate Governance—Independence of Directors” of the 2019 Proxy Statement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

Information regarding principal accounting fees and services is incorporated herein by reference to the material under the heading “The Company’s Independent Registered Public Accounting Firm” of the 2019 Proxy Statement.

PART IV

ITEM 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) 1. Financial Statements

The financial statements listed in the accompanying index (page F-1) to the financial statements are filed as part of this Annual Report on Form 10-K.

(b) Exhibits

The exhibits listed in the Exhibit Index on the following page are filed or incorporated by reference as part of this Annual Report on Form 10-K.

(c) Financial Statement Schedules omitted

Certain schedules have been omitted because the required information is included in the Consolidated Financial Statements and Notes thereto or because they are not applicable or not required.

ITEM 16. FORM 10-K SUMMARY

None.

INDEX TO EXHIBITS

2.1 Agreement and Plan of Merger by and among Courier Corporation, R. R. Donnelley & Sons Company, Raven Solutions, Inc. and Raven Ventures LLC, dated as of February 5, 2015 (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K dated February 11, 2015, filed on February 11, 2015).

2.2 Separation and Distribution Agreement, dated as of September 14, 2016, by and among R.R. Donnelley & Sons Company, LSC Communications, Inc. and Donnelley Financial Solutions, Inc. (incorporated by reference to Exhibit 2.1 to the Company's Current Report on 8-K filed October 3, 2016).

2.3 Transition Services Agreement, dated as of September 14, 2016, between LSC Communications, Inc. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.2 to the Company's Current Report on 8-K filed October 3, 2016).

2.4 Transition Services Agreement, dated as of September 14, 2016, between Donnelley Financial Solutions, Inc. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.3 to the Company's Current Report on 8-K filed October 3, 2016).

2.5 Tax Disaffiliation Agreement, dated as of September 14, 2016, between LSC Communications, Inc. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.4 to the Company's Current Report on 8-K filed October 3, 2016).

2.6 Tax Disaffiliation Agreement, dated as of September 14, 2016, between Donnelley Financial Solutions, Inc. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.5 to the Company's Current Report on 8-K filed October 3, 2016).

2.7 Patent Assignment and License Agreement, dated as of September 27, 2016, between LSC Communications US, LLC. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.6 to the Company's Current Report on 8-K filed October 3, 2016).

2.8 Patent Assignment and License Agreement, dated as of September 27, 2016, between Donnelley Financial Solutions, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.7 to the Company's Current Report on 8-K filed October 3, 2016).

2.9 Trademark Assignment and License Agreement, dated as of September 27, 2016, between LSC Communications US, LLC. and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.8 to the Company's Current Report on 8-K filed October 3, 2016).

2.10 Trademark Assignment and License Agreement, dated as of September 27, 2016, between Donnelley Financial, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.9 to the Company's Current Report on 8-K filed October 3, 2016).

2.11 Data Assignment and License Agreement, dated as of September 27, 2016, between LSC Communications US, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.10 to the Company's Current Report on 8-K filed October 3, 2016).

2.12

Data Assignment and License Agreement, dated as of September 27, 2016, between Donnelley Financial, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.11 to the Company's Current Report on 8-K filed October 3, 2016).

2.13 Software, Copyright and Trade Secret Assignment and License Agreement, dated as of September 27, 2016, between LSC Communications US, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.12 to the Company's Current Report on 8-K filed October 3, 2016).

2.14 Software, Copyright and Trade Secret Assignment and License Agreement, dated as of September 27, 2016, between Donnelley Financial, LLC and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 2.13 to the Company's Current Report on 8-K filed October 3, 2016).

3.1 Restatement of Certificate of Incorporation of R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 3.3 to the Company's Current Report on 8-K filed October 3, 2016).

3.2 Amended and Restated By-Laws of R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 3.4 to the Company's Current Report on 8-K filed October 3, 2016).

4.1 Instruments, other than those defining the rights of holders of long-term debt not registered under the Securities Exchange Act of 1934 of the registrant and of all subsidiaries for which consolidated or unconsolidated financial statements are required to be filed are being omitted pursuant to paragraph (4)(iii)(A) of Item 601 of Regulation S-K. Registrant agrees to furnish a copy of any such instrument to the Commission upon request.

4.2 Indenture dated as of November 1, 1990 between the Company and Citibank, N.A., as Trustee (incorporated by reference to Exhibit 4 filed with the Company's Form SE filed on March 26, 1992) (P)

4.3 Indenture dated as of January 3, 2007 between the Company and LaSalle Bank National Association, as Trustee (incorporated by reference to Exhibit 4.1 to the Company's Registration Statement on Form S-3 filed on January 3, 2007)

10.1 Policy on Retirement Benefits, Phantom Stock Grants and Stock Options for Directors (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008, filed on August 6, 2008)*

10.2 Non-Employee Director Compensation Plan (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 7, 2015)*

10.3 Directors' Deferred Compensation Agreement, as amended (incorporated by reference to Exhibit 10(b) to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 1998, filed on November 12, 1998)*

10.4 Amended and Restated Non-Qualified Deferred Compensation Plan (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 7, 2015)*

10.5 2017 Performance Incentive Plan (incorporated by reference to Appendix A to the Company's Annual Proxy Statement on Schedule 14A for the fiscal year ended December 31, 2016, filed on April 10, 2017)*

10.6 2012 Performance Incentive Plan (incorporated by reference to Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, filed on July 30, 2013)*

10.7 2004 Performance Incentive Plan (incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K for the year ended December 31, 2008, filed on February 25, 2009)*

10.8 Amended and Restated R.R. Donnelley & Sons Company Unfunded Supplemental Benefit Plan (incorporated by reference to Exhibit 10.11 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010, filed on November 3, 2010)*

10.9 Amendment to Amended and Restated R.R. Donnelley & Sons Company Unfunded Supplemental Benefit Plan (incorporated by reference to Exhibit 10.12 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2010, filed on November 3, 2010)*

10.10 Supplemental Executive Retirement Plan for Designated Executives—B (incorporated by reference to Exhibit 10.1 to Moore Wallace Incorporated's (Commission file number 1-8014) Quarterly Report on Form 10-Q for the quarter ended September 30, 2001, filed on November 14, 2001)*

10.11 Form of Option Agreement for certain executive officers (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2004, filed on March 14, 2005)*

10.12

Form of Restricted Stock Unit Award Agreement for certain executive officers, as amended (incorporated by reference to Exhibit 10.17 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2008, filed on February 25, 2009)*

10.13 Form of Restricted Stock Unit Award Agreement for certain executive officers (incorporated by reference to Exhibit 10.12 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 7, 2015)*

10.14 Form of Restricted Stock Unit Award Agreement for directors (incorporated by reference to Exhibit 10.21 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2004, filed on March 14, 2005)*

10.15 Form of Restricted Stock Unit Award Agreement for directors (incorporated by reference to Exhibit 10.25 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2007, filed on February 27, 2008)*

10.16 Form of Amendment to Director Restricted Stock Unit Awards dated May 21, 2009 (incorporated by reference to Exhibit 10.23 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2009, filed on August 5, 2009)*

10.17 Form of Amendment to Director Restricted Stock Unit Awards (incorporated by reference to Exhibit 10.22 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2008, filed on February 25, 2009)*

10.18 Form of Restricted Stock Unit Award Agreement for directors (incorporated by reference to Exhibit 10.23 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2008, filed on February 25, 2009)*

10.19 Form of Director Restricted Stock Unit Awards (incorporated by reference to Exhibit 10.26 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2009, filed on August 5, 2009)*

10.20 Form of Performance Share Unit Award Agreement (incorporated by reference to Exhibit 10.19 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 7, 2015)*

10.21 Form of Performance Share Unit Award Agreement (incorporated by reference to Exhibit 10.23 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, filed on May 1, 2014)*

10.22 Form of Performance Share Unit Award Agreement (incorporated by reference to Exhibit 10.20 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, filed on April 25, 2013)*

10.23 Form of Cash Retention Award Agreement (incorporated by reference to Exhibit 10.21 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, filed on April 25, 2013)*

10.24 Form of Cash Bonus Award Agreement for certain executive officers (incorporated by reference to Exhibit 10.30 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2012, filed on May 2, 2012)*

10.25 Form of Long Term Incentive Cash Award Agreement (incorporated by reference to Exhibit 10.22 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, filed on May 1, 2014)*

10.26 Form of Amendment to Cash Retention Awards (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K dated March 2, 2016, filed on March 2, 2016)*

10.27 Form of Performance Unit Award Agreement (filed herewith)*

10.28 Form of Restricted Stock Unit Award Agreement (filed herewith)*

10.29 Form of Long-Term Incentive Cash Award Agreement (filed herewith)*

10.30 Form of Amended and Restated Indemnification Agreement for directors (incorporated by reference to Exhibit 10.31 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2013, filed on February 26, 2014)*

10.31 Amended and Restated Annual Incentive Plan (incorporated by reference to Exhibit 10.32 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015, filed on May 7, 2015)*

10.32 Second Amended and Restated Credit Agreement, dated as of September 29, 2017, among R.R. Donnelley & Sons Company, the guarantors party thereto, the lenders party thereto and Bank of America, N.A., as Administrative Agent (incorporated by reference to Exhibit 10.1 to the Company's Current Report on 8-K filed October 3, 2017).

10.33 R.R. Donnelley & Sons Company Non-Employee Director Compensation Plan (incorporated by reference to Exhibit 10.2 to the Company's Current Report on 8-K filed October 3, 2016).*

10.34 Employment Agreement, dated as of October 1, 2016, between Daniel L. Knotts and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 10.3 to the Company's Current Report on 8-K filed October 3, 2016).*

10.35 Employment Agreement, dated as of October 1, 2016, between John Pecaric and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 10.6 to the Company's Current Report on 8-K filed October 3,

2016).*

10.36 Employment Agreement, dated as of October 1, 2016, between Terry D. Peterson and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 10.7 to the Company's Current Report on 8-K filed October 3, 2016).*

10.37 Employment Agreement, dated as of October 1, 2016, between Deborah L. Steiner and R.R. Donnelley & Sons Company (incorporated by reference to Exhibit 10.8 to the Company's Current Report on 8-K filed October 3, 2016).*

10.38 Form of Indemnification Agreement for directors (incorporated by reference to Exhibit 10.36 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 31, 2016, filed on November 2, 2016)*

10.39 Employment Offer Letter dated October 25, 2017 between R.R. Donnelley & Sons Company and Michael J. Sharp (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on October 30, 2017).

10.40 Credit Agreement, dated as of October 15, 2018, among R. R. Donnelley and Sons Company, the lenders party thereto and Bank of America, N.A., as administrative agent (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed October 15, 2018)

10.41 Amendment No. 1 to Credit Agreement, dated as of October 15, 2018, among R. R. Donnelley and Sons Company, the guarantors party thereto, the lenders party thereto and Bank of America, N.A., as administrative agent (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K filed October 15, 2018)

21 Subsidiaries of the Company (filed herewith)

23 Consent of Deloitte & Touche LLP (filed herewith)

24	Power of Attorney (filed herewith)
31.1	Certification by Daniel L. Knotts, President and Chief Executive Officer, required by Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934 (filed herewith)
31.2	Certification by Terry D. Peterson, Executive Vice President and Chief Financial Officer, required by Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934 (filed herewith)
32.1	Certification by Daniel L. Knotts, President and Chief Executive Officer, required by Rule 13a-14(b) or Rule 15d-14(b) of the Securities Exchange Act of 1934 and Section 1350 of Chapter 63 of Title 18 of the United States Code (filed herewith)
32.2	Certification by Terry D. Peterson, Executive Vice President and Chief Financial Officer, required by Rule 13a-14(b) or Rule 15d-14(b) of the Securities Exchange Act of 1934 and Section 1350 of Chapter 63 of Title 18 of the United States Code (filed herewith)
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document

*Management contract or compensatory plan or arrangement.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on the 27th day of February 2019.

R.R. DONNELLEY & SONS COMPANY

By: / S / Terry D. Peterson
Terry D. Peterson

Executive Vice President and Chief Financial Officer

(Principal Financial Officer)

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated, on the 27th day of February 2019.

Signature and Title	Signature and Title
/ S / DANIEL L. KNOTTS Daniel L. Knotts	/ S / TIMOTHY R. MCLEVISH * Timothy R. Mclevish
President and Chief Executive Officer, Director	Director
(Principal Executive Officer)	
/ S / Terry D. Peterson Terry D. Peterson	/ S / JAMIE MOLDAFSKY * Jaime Moldafsky
Executive Vice President and Chief Financial Officer	Director
(Principal Financial Officer)	
/ S / MICHAEL J. SHARP	/ S / JOHN C. POPE *

Michael J. Sharp	John C. Pope
Senior Vice President and Chief Accounting Officer	Chairman of the Board, Director
(Principal Accounting Officer)	
/ S / P. CODY PHIPPS *	/ S / IRENE M. ESTEVES *
P. Cody Phipps	Irene M. Esteves
Director	Director
/ S / SUSAN M. GIANINNO *	
Susan M. Gianinno	
Director	

By: / S / Deborah L. Steiner
Deborah L. Steiner

As Attorney-in-Fact

* By Deborah L. Steiner as Attorney-in-Fact pursuant to Powers of Attorney executed by the directors listed above, which Powers of Attorney have been filed with the Securities and Exchange Commission.

ITEM 15(a). INDEX TO FINANCIAL STATEMENTS

	Page
Consolidated Statements of Operations for each of the three years in the period ended December 31, 2018	F-2
Consolidated Statements of Comprehensive Loss for each of the three years in the period ended December 31, 2018	F-3
Consolidated Balance Sheets as of December 31, 2018 and 2017	F-4
Consolidated Statements of Cash Flows for each of the three years in the period ended December 31, 2018	F-5
Consolidated Statements of Stockholders' Equity for each of the three years in the period ended December 31, 2018	F-6
Notes to Consolidated Financial Statements	F-7
Report of Independent Registered Public Accounting Firm	F-44
Unaudited Interim Financial Information	F-45

R.R. DONNELLEY & SONS COMPANY AND SUBSIDIARIES (“RRD”)

CONSOLIDATED STATEMENTS OF OPERATIONS

(in millions, except per share data)

	Year Ended December 31,		
	2018	2017	2016
Products net sales	$5,317.7	$5,326.0	$5,225.4
Services net sales	1,482.5	1,613.6	1,607.6
Total net sales	6,800.2	6,939.6	6,833.0
Products cost of sales (exclusive of depreciation and amortization)	4,315.8	4,264.1	4,125.3
Services cost of sales (exclusive of depreciation and amortization)	1,229.0	1,359.3	1,359.0
Total cost of sales	5,544.8	5,623.4	5,484.3
Products gross profit	1,001.9	1,061.9	1,100.1
Services gross profit	253.5	254.3	248.6
Total gross profit	1,255.4	1,316.2	1,348.7
Selling, general and administrative expenses (exclusive of depreciation and amortization)	830.4	860.4	897.0
Restructuring, impairment and other charges-net (Note 5)	38.8	53.0	584.3
Depreciation and amortization	181.4	191.4	204.2
Other operating income	(3.8)	—	(11.9)
Income (loss) from operations	208.6	211.4	(324.9)
Interest expense-net (Note 12)	168.3	179.6	198.7
Investment and other income-net	(20.4)	(63.8)	(26.4)
Loss on debt extinguishment	32.4	20.1	—
Earnings (loss) before income taxes	28.3	75.5	(497.2)
Income tax expense (benefit) (Note 11)	37.9	108.7	(12.3)
Net loss from continuing operations	(9.6)	(33.2)	(484.9)
Loss from discontinued operations, net of tax (Note 2)	—	—	(9.7)
Net loss	(9.6)	(33.2)	(494.6)
Less: Income attributable to noncontrolling interests	1.4	1.2	1.3
Net loss attributable to RRD common stockholders	$(11.0)	$(34.4)	$(495.9)
Basic net loss per share attributable to RRD common stockholders (Note 14):			
Continuing operations	$(0.16)	$(0.49)	$(6.95)
Discontinued operations	—	—	(0.14)
Net loss attributable to RRD stockholders	(0.16)	(0.49)	(7.09)
Diluted net loss per share attributable to RRD common stockholders (Note 14):			
Continuing operations	$(0.16)	$(0.49)	$(6.95)
Discontinued operations	—	—	(0.14)
Net loss attributable to RRD stockholders	(0.16)	(0.49)	(7.09)
Weighted average number of common shares outstanding			
Basic	70.6	70.2	70.0
Diluted	70.6	70.2	70.0

See accompanying Notes to Consolidated Financial Statements.

R.R. DONNELLEY & SONS COMPANY AND SUBSIDIARIES (“RRD”)

CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS

(in millions)

	Year Ended December 31,		
	2018	2017	2016
Net loss	$(9.6)	$(33.2)	$(494.6)
Other comprehensive (loss) income, net of tax (Note 15):			
Translation adjustments	(39.9)	57.1	(38.3)
Adjustment for net periodic pension and other postretirement benefits plan cost	11.4	14.9	11.2
Adjustment for available-for-sale securities	—	(119.3)	119.3
Other comprehensive (loss) income	(28.5)	(47.3)	92.2
Comprehensive loss	(38.1)	(80.5)	(402.4)
Less: comprehensive income attributable to noncontrolling interests	1.0	1.9	0.8
Comprehensive loss attributable to RRD common stockholders	$(39.1)	$(82.4)	$(403.2)

See accompanying Notes to Consolidated Financial Statements.

R.R. DONNELLEY & SONS COMPANY AND SUBSIDIARIES (“RRD”)

CONSOLIDATED BALANCE SHEETS

(in millions, except per share data)

	December 31,	
	2018	2017
ASSETS		
Cash and cash equivalents	$370.6	$273.4
Receivables, less allowances for doubtful accounts of $25.9 in 2018 (2017 - $32.4) (Note 1)	1,298.3	1,417.6
Inventories (Note 1)	329.7	416.8
Prepaid expenses and other current assets	101.1	109.1
Total current assets	2,099.7	2,216.9
Property, plant and equipment-net (Note 1)	531.3	615.1
Goodwill (Note 6)	553.4	588.5
Other intangible assets-net (Note 6)	113.3	143.3
Deferred income taxes (Note 11)	66.9	81.7
Other noncurrent assets	276.2	259.0
Total assets	$3,640.8	$3,904.5
LIABILITIES		
Accounts payable	$987.3	$1,094.7
Accrued liabilities and other (Note 8)	347.4	447.5
Short-term and current portion of long-term debt (Note 12)	216.2	10.8
Total current liabilities	1,550.9	1,553.0
Long-term debt (Note 12)	1,875.3	2,098.9
Pension liabilities (Note 10)	97.9	102.7
Other postretirement benefits plan liabilities (Note 10)	67.8	113.2
Long-term income tax liability (Note 11)	91.1	59.4
Other noncurrent liabilities	203.2	180.2
Total liabilities	3,886.2	4,107.4
Commitments and Contingencies (Note 9)		
EQUITY		
RRD stockholders' equity		
Preferred stock, $1.00 par value		
Authorized: 2.0 shares; Issued: None	—	—
Common stock, $0.01 par value		
Authorized: 165.0 shares;		
Issued: 89.0 shares in 2018 and 2017	0.9	0.9
Additional paid-in-capital	3,404.0	3,444.0
Accumulated deficit	(2,225.7)	(2,225.7)
Accumulated other comprehensive loss	(153.8)	(103.7)
Treasury stock, at cost, 18.6 shares in 2018 (2017 - 18.9 shares)	(1,285.5)	(1,333.1)
Total RRD stockholders' equity	$(260.1)	$(217.6)
Noncontrolling interests	14.7	14.7

Total equity	(245.4)	(202.9)
Total liabilities and equity	$3,640.8	$3,904.5

See accompanying Notes to Consolidated Financial Statements.

R.R. DONNELLEY & SONS COMPANY AND SUBSIDIARIES (“RRD”)

CONSOLIDATED STATEMENTS OF CASH FLOWS

(in millions)

	Year Ended December 31,		
	2018	2017	2016
OPERATING ACTIVITIES			
Net loss	$(9.6)	$(33.2)	$(494.6)
Adjustments to reconcile net loss to net cash provided by operating activities:			
Impairment charges-net	13.9	22.4	558.3
Depreciation and amortization	181.4	191.4	363.2
Provision for doubtful accounts receivable	13.3	3.2	22.7
Share-based compensation	8.6	8.4	12.9
Deferred income taxes	2.7	21.2	(57.6)
Changes in uncertain tax positions	(4.8)	(2.8)	(3.6)
Gain on investments and other assets-net	(14.9)	(2.8)	(11.4)
Realized gain on disposition of available-for-sale securities-net	—	(42.4)	—
Loss on debt extinguishments	32.4	20.1	96.1
Net pension and other postretirement benefits plan income	(22.5)	(14.7)	(59.8)
Net loss on pension and other postretirement benefits plan settlements and curtailments	1.9	1.6	79.3
Other	9.2	19.7	19.0
Changes in operating assets and liabilities - net of dispositions and acquisitions:			
Accounts receivable-net	48.0	(57.3)	(223.0)
Inventories	15.0	(20.1)	(40.3)
Prepaid expenses and other current assets	0.9	3.7	2.7
Accounts payable	(68.7)	71.2	(20.6)
Income taxes payable and receivable	55.2	87.4	(53.7)
Accrued liabilities and other	(40.6)	(42.7)	(39.9)
Pension and other postretirement benefits plan contributions	(17.9)	(16.4)	(22.5)
Net cash provided by operating activities	203.5	217.9	127.2
INVESTING ACTIVITIES			
Capital expenditures	(104.4)	(108.5)	(172.1)
Acquisitions of businesses, net of cash acquired	—	—	(48.1)
Disposition of businesses, net of cash disposed	44.1	—	13.7
Proceeds from sales of investments and other assets	54.5	140.4	3.8
Other investing activities	(1.6)	(7.2)	2.1
Net cash (used in) provided by investing activities	(7.4)	24.7	(200.6)
FINANCING ACTIVITIES			
Proceeds from issuance of long-term debt	544.5	—	1,164.0
Proceeds from other short-term debt	94.5	20.7	9.2
Payments on other short-term debt	(62.4)	(17.0)	(26.7)
Payments of current maturities and long-term debt	(460.7)	(201.6)	(1,013.2)
Proceeds from credit facility borrowings	1,246.1	1,437.0	850.0
Payments on credit facility borrowings	(1,403.1)	(1,406.0)	(665.0)

Debt issuance costs	(10.6)	(5.9)	(37.5)
Dividends paid	(23.9)	(39.2)	(173.0)
Net transfer of cash, cash equivalents and restricted cash to LSC and Donnelley Financial	—	(78.0)	(85.9)
Payments of withholding taxes on share-based compensation	(0.9)	(2.2)	(7.6)
Other financing activities	(0.7)	(2.1)	5.6
Net cash (used in) provided by financing activities	(77.2)	(294.3)	19.9
Effect of exchange rate on cash, cash equivalents and restricted cash	(16.8)	17.3	(16.5)
Net increase (decrease) in cash, cash equivalents and restricted cash	102.1	(34.4)	(70.0)
Cash, cash equivalents and restricted cash at beginning of year	301.5	335.9	405.9
Cash, cash equivalents and restricted cash at end of period	$403.6	$301.5	$335.9
Supplemental non-cash disclosure:			
Debt-for-equity exchange	$—	$132.9	$—
Assumption of warehousing equipment related to client contract	—	—	8.8
Debt-for-debt exchange, including debt issuance costs of $5.5 million	—	—	300.0

See accompanying Notes to Consolidated Financial Statements.

R.R. DONNELLEY & SONS COMPANY AND SUBSIDIARIES (“RRD”)

CONSOLIDATED STATEMENTS OF STOCKHOLDERS’ EQUITY

(in millions)

	Common Stock Shares	Common Stock Amount	Additional Paid-in-Capital	Treasury Stock Shares	Treasury Stock Amount	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total RRD's Stockholders' Equity	Noncontrolling Interests	Total Equity
Balance at January 1, 2016	89.0	$111.2	$3,386.8	(19.4)	$(1,401.5)	$(620.6)	$(793.2)	$682.7	$13.9	$696.6
Net (loss) earnings						(495.9)		(495.9)	1.3	(494.6)
Other comprehensive income (loss)							92.7	92.7	(0.5)	92.2
Share-based compensation			12.9					12.9		12.9
Par value amendment		(110.3)	110.3					—		—
Issuance of share-based awards, net of withholdings and other			(41.5)	0.3	37.5			(4.0)		(4.0)
Cash dividends paid						(173.0)		(173.0)		(173.0)
Distribution of LSC and Donnelley Financial						(865.9)	644.8	(221.1)		(221.1)
Distributions to noncontrolling interests								—	(1.2)	(1.2)
Balance at December 31, 2016	89.0	$0.9	$3,468.5	(19.1)	$(1,364.0)	$(2,155.4)	$(55.7)	$(105.7)	$13.5	$(92.2)
Net (loss) earnings						(34.4)		(34.4)	1.2	(33.2)
Other comprehensive (loss) income							(48.0)	(48.0)	0.7	(47.3)
Share-based compensation			8.4					8.4		8.4

Issuance of share-based awards, net of withholdings and other			(32.9)	0.2	30.9			(2.0)		(2.0)
Cash dividends paid						(39.2)		(39.2)		(39.2)
Spinoff adjustments						3.3		3.3		3.3
Distributions to noncontrolling interests								—	(0.7)	(0.7)
Balance at December 31, 2017	89.0	$0.9	$3,444.0	(18.9)	$(1,333.1)	$(2,225.7)	$(103.7)	$(217.6)	$14.7	$(202.9)
Net (loss) earnings						(11.0)		(11.0)	1.4	(9.6)
Cumulative impact of adopting ASU 2018-02, net of tax						22.0	(22.0)	—		—
Other comprehensive loss							(28.1)	(28.1)	(0.4)	(28.5)
Share-based compensation			8.6					8.6		8.6
Issuance of share-based awards, net of withholdings and other			(48.6)	0.3	47.6			(1.0)		(1.0)
Cash dividends paid						(23.9)		(23.9)		(23.9)
Cumulative impact of adopting ASU 2014-09, net of tax						12.9		12.9		12.9
Distributions to noncontrolling interests								—	(1.0)	(1.0)
Balance at December 31, 2018	89.0	$0.9	$3,404.0	(18.6)	$(1,285.5)	$(2,225.7)	$(153.8)	$(260.1)	$14.7	$(245.4)

See accompanying Notes to Consolidated Financial Statements

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)

Note 1. Basis of Presentation and Summary of Significant Accounting Policies

Basis of Presentation —The accompanying consolidated financial statements include the accounts of R.R. Donnelley & Sons Company and its subsidiaries (the “Company” or “RRD”) and have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”). All intercompany transactions have been eliminated in consolidation. The accounts of businesses acquired during 2016 are included in the Consolidated Financial Statements from the dates of acquisition.

Spinoff Transactions

On October 1, 2016, we completed the separation of our financial communications and data services business (“Donnelley Financial Solutions, Inc.” or “Donnelley Financial”) and the publishing and retail-centric print services and office products business (“LSC Communications, Inc.” or “LSC”) into two separate publicly-traded companies (the "Separation"). We completed the tax-free distribution of 80.75% of the outstanding common stock of each Donnelley Financial and LSC to our stockholders of record on September 23, 2016 who received one share of Donnelley Financial and LSC for every eight shares of RRD common stock held as of the record date (the “Distribution”). We retained 19.25% of the outstanding common stock of each Donnelley Financial and LSC. The historical financial results of Donnelley Financial and LSC prior to the Separation are presented as discontinued operations on the Consolidated Statements of Operations and, as such, have been excluded from both continuing operations and segment results for all periods presented. Sales from RRD to Donnelley Financial and LSC previously eliminated in consolidation have been recast and are now shown as external sales of RRD within the financial results of continuing operations. Unless indicated otherwise, the information in the Notes to Consolidated Financial Statements relates to our continuing operations. Prior periods have been recast to reflect our current segment reporting structure. See Note 2, Discontinued Operations, for more information on the Separation.

Reverse Stock Split

Immediately following the Distribution on October 1, 2016, we affected a one for three reverse stock split for RRD common stock (the “Reverse Stock Split”). The Reverse Stock Split was approved by our Board of Directors on September 14, 2016 and previously approved by our stockholders at the annual meeting on May 19, 2016.

Nature of Operations —RRD is a global, integrated communications provider enabling organizations to create, manage, deliver and optimize their multichannel marketing and business communications. We have a flexible and comprehensive portfolio of integrated communications solutions that allows our clients to engage audiences, reduce costs and drive revenues. Our innovative content management offering, production platform, supply chain management, outsourcing capabilities and customized consultative expertise assist our clients in the delivery of integrated messages across multiple media to highly targeted audiences at optimal times for clients in virtually every private and public sector.

Use of Estimates —The preparation of consolidated financial statements, in conformity with GAAP, requires the extensive use of management’s estimates and assumptions that affect the reported amounts of assets and liabilities and

disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting periods. Actual results could differ from these estimates. Estimates are used when accounting for items and matters including, but not limited to, allowance for uncollectible accounts receivable, inventory obsolescence, asset valuations and useful lives, employee benefits, self-insurance reserves, taxes, restructuring and other provisions and contingencies.

Foreign Operations —Assets and liabilities denominated in foreign currencies are translated into U.S. dollars at the exchange rates existing at the respective balance sheet dates. Income and expense items are translated at the average rates during the respective periods. Translation adjustments resulting from fluctuations in exchange rates are recorded as a separate component of other comprehensive income (loss) while transaction gains and losses are recorded in net earnings (loss). Deferred taxes are not provided on cumulative foreign currency translation adjustments when we expect foreign earnings to be permanently reinvested.

Fair Value Measurements —Certain assets and liabilities are required to be recorded at fair value on a recurring basis. Fair value is determined based on the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants. We record the fair value of our foreign currency contracts, available-for-sale securities, interest rate swaps, pension plan assets and other postretirement benefits (“OPEB”) plan assets on a recurring basis. Assets measured at fair value on a nonrecurring basis include long-lived assets held and used, long-lived assets held for sale, goodwill and other intangible assets. The fair value of cash, cash equivalents, restricted cash, accounts receivable, short-term debt and accounts payable approximate their carrying values. The three-tier value hierarchy, which prioritizes valuation methodologies based on the reliability of the inputs, is:

Level 1 —Valuations based on quoted prices for identical assets and liabilities in active markets.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Level 2 —Valuations based on observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data.

Level 3 —Valuations based on unobservable inputs reflecting our own assumptions, consistent with reasonably available assumptions made by other market participants.

Cash, Cash Equivalents and Restricted Cash

Cash and cash equivalents —We consider all highly liquid investments with original maturities of three months or less to be cash equivalents. Short-term securities consist of investment grade instruments of governments, financial institutions and corporations.

Restricted cash —Amounts included in restricted cash primarily relate to letters of credit and bank acceptance drafts.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the Consolidated Balance Sheets that sum to the total of the same such amounts shown in the Consolidated Statement of Cash Flows.

	December 31,	
	2018	2017
Cash and cash equivalents	$370.6	$273.4
Restricted cash - current [(a)]	32.9	28.0
Restricted cash - noncurrent [(b)]	0.1	0.1
Total cash, cash equivalents and restricted cash	$403.6	$301.5

(a) Included within Prepaid expenses and other current assets within the Consolidated Balance Sheets.
(b) Included within Other noncurrent assets within the Consolidated Balance Sheets.

Receivables —Receivables are stated net of allowances for doubtful accounts and primarily include trade receivables, notes receivable and miscellaneous receivables from suppliers. No single client comprised more than 10% of our consolidated net sales in 2018, 2017 or 2016. Specific client provisions are made when a review of significant outstanding amounts, utilizing information about client creditworthiness and current economic trends, indicates that collection is doubtful. In addition, provisions are made at differing rates, based upon the age of the receivable and our historical collection experience.

Transactions affecting the allowance for doubtful accounts receivable during the years ended December 31, 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Balance, beginning of year	$32.4	$35.9	$26.0

Provisions charged to expense	13.3	3.2	12.1
Write-offs and other	(19.8)	(6.7)	(2.2)
Balance, end of year	$25.9	$32.4	$35.9

Inventories —Inventories include material, labor and factory overhead and are stated at the lower of cost or market and net of excess and obsolescence reserves for raw materials and finished goods. Provisions for excess and obsolete inventories are made at differing rates, utilizing historical data and current economic trends, based upon the age and type of the inventory. Specific excess and obsolescence provisions are also made when a review of specific balances indicates that the inventories will not be utilized in production or sold. The cost of 32.2% and 37.7% of the inventories at December 31, 2018 and 2017, respectively, has been determined using the Last-In, First-Out (LIFO) method. This method is intended to reflect the effect of inventory replacement costs within results of operations; accordingly, charges to cost of sales generally reflect recent costs of material, labor and factory overhead. We use an external-index method of valuing LIFO inventories. The remaining inventories, primarily related to certain acquired and international operations, are valued using the First-In, First-Out or specific identification methods.

The components of inventories, net of excess and obsolescence reserves for raw materials and finished goods, at December 31, 2018 and 2017 were as follows:

	2018	2017
Raw materials and manufacturing supplies	$153.1	$161.1
Work in process	75.1	75.0
Finished goods	120.1	198.2
LIFO reserve	(18.6)	(17.5)
Total	$329.7	$416.8

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We recognized LIFO expense of $1.1 million during the year ended December 31, 2018 and LIFO benefits of $0.5 million and $1.1 million, respectively, during the years ended December 31, 2017 and 2016.

Long-Lived Assets —We assess potential impairments to our long-lived assets if events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. An impaired asset is written down to its estimated fair value based upon the most recent information available. Estimated fair market value is generally measured by discounting estimated future cash flows. Long-lived assets, other than goodwill and other intangible assets, which are held for sale, are recorded at the lower of the carrying value or the fair market value less the estimated cost to sell.

Property, Plant and Equipment —Property, plant and equipment are recorded at cost and depreciated on a straight-line basis over their estimated useful lives. Useful lives range from 15 to 40 years for buildings, the lesser of 7 years or the lease term for leasehold improvements and from 3 to 15 years for machinery and equipment. Maintenance and repair costs are charged to expense as incurred. Major overhauls that extend the useful lives of existing assets are capitalized. When properties are retired or disposed, the costs and accumulated depreciation are eliminated and the resulting profit or loss is recognized in the results of operations.

The components of property, plant and equipment at December 31, 2018 and 2017 were as follows:

	2018	2017
Land	$51.0	$56.1
Buildings	389.5	417.3
Machinery and equipment	1,797.1	1,885.2
	2,237.6	2,358.6
Accumulated depreciation	(1,706.3)	(1,743.5)
Total	$531.3	$615.1

During the years ended December 31, 2018, 2017 and 2016, depreciation expense was $126.5 million, $139.8 million, and $152.9 million, respectively.

During the fourth quarter of 2017, we entered into an agreement to sell a printing facility in Shenzhen, China and transfer the related land use rights. During 2018 and 2017, we received non-refundable deposits in accordance with the terms of the agreement of approximately $32.1 million and $12.5 million, respectively, which are recorded in Other noncurrent liabilities on the Consolidated Balance Sheets. As of December 31, 2018, we continue to classify the carrying cost of the building within property, plant and equipment and record depreciation expense. The carrying cost of the land use rights are classified in Other noncurrent assets and we continue to record amortization expense. The combined carrying cost of the building and land use rights is not significant.

Goodwill —Goodwill is reviewed for impairment annually as of October 31 or more frequently if events or changes in circumstances indicate that it is more likely than not that the fair value of a reporting unit is below its carrying value.

For certain reporting units, we may perform a qualitative, rather than quantitative, assessment to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount. In performing this qualitative analysis, we consider various factors, including the excess of prior year estimates of fair value compared to carrying value, the effect of market or industry changes and the reporting units' actual results compared to projected results. Based on this qualitative analysis, if we determine that it is more likely than not that the fair value of the reporting unit is greater than its carrying value, no further impairment testing is performed.

For the remaining reporting units, we compare each reporting unit's fair value, estimated based on comparable company market valuations and expected future discounted cash flows to be generated by the reporting unit, to its carrying value. See Note 5, Restructuring, Impairment and Other Charges and Note 6, Goodwill and Other Intangible Assets, for further discussion.

We also perform a review for indicators of impairment at each quarter-end to assess whether an interim impairment review is required for any reporting unit. In our review for indicators of impairment as of December 31, 2018, we concluded that there were no indicators that the fair value of any of the reporting units with goodwill was more likely than not below its carrying value.

Amortization —Certain costs to acquire and develop internal-use computer software are capitalized and amortized over their estimated useful life using the straight-line method, up to a maximum of five years. Amortization expense, primarily related to internally-developed software and excluding amortization expense related to other intangible assets, was $27.4 million, $23.0 million and $17.6 million for the years ended December 31, 2018, 2017 and 2016, respectively. Deferred debt issuance costs are amortized over the term of the related debt. Other intangible assets are recognized separately from goodwill and are amortized over their estimated useful lives. See Note 6, Goodwill and Other Intangible Assets, for further discussion of other intangible assets and the related amortization expense.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Financial Instruments —We use derivative financial instruments to hedge exposures to foreign exchange fluctuations in the ordinary course of business.

All derivatives are recorded as other current or noncurrent assets or other current or noncurrent liabilities on the balance sheet at their respective fair values with unrealized gains and losses recorded in other comprehensive income (loss), net of applicable income taxes, or in the results of operations, depending on the purpose for which the derivative is held. For derivatives designated and that qualify as fair value hedges, the gain or loss on the derivative, as well as the offsetting gain or loss on the hedged item attributable to the hedged risk, are recognized in the results of operations. Changes in the fair value of derivatives that do not meet the criteria for designation as a hedge at inception, or fail to meet the criteria thereafter, are recognized currently in the results of operations. At inception of a hedge transaction, we formally document the hedge relationship and the risk management objective for undertaking the hedge. In addition, we assess, both at inception of the hedge and on an ongoing basis, whether the derivative in the hedging transaction has been highly effective in offsetting changes in fair value of the hedged item and whether the derivative is expected to continue to be highly effective. The impact of any ineffectiveness is recognized currently in the results of operations.

Our foreign currency contracts are subject to enforceable master netting agreements that allow us to settle positive and negative positions with the respective counterparties. We settle foreign currency contracts on a net basis when possible. Foreign currency contracts that can be settled on a net basis are presented net in the Consolidated Balance Sheets. See Note 13, Derivatives, for additional information.

Share-Based Compensation —We recognize share-based compensation expense based on estimated fair values for all share-based awards made to employees and directors, including stock options, restricted stock units and performance share units. We recognize compensation expense for share-based awards expected to vest on a straight-line basis over the requisite service period of the award based on their grant date fair value. See Note 16, Stock and Incentive Programs for Employees and Directors, for further discussion.

Preferred Stock —We have two million shares of $1.00 par value preferred stock authorized for issuance. The Board of Directors may divide the preferred stock into one or more series and fix the redemption, dividend, voting, conversion, sinking fund, liquidation and other rights. We have no present plans to issue any preferred stock.

Pension and OPEB Plans —We record annual income and expense amounts relating to our pension and OPEB plans based on calculations which include various actuarial assumptions, including discount rates, mortality, assumed rates of return, compensation increases, turnover rates and healthcare cost trend rates. We review our actuarial assumptions on an annual basis and make modifications to the assumptions based on current rates and trends when it is deemed appropriate to do so. The effect of modifications on the value of plan obligations and assets is recognized immediately within other comprehensive income (loss) and amortized into operating earnings over future periods. We believe that the assumptions utilized in recording our obligations under our plans are reasonable based on our experience, market conditions and input from our actuaries and investment advisors. See Note 10, Retirement Plans, for additional information.

Taxes on Income —Deferred taxes are provided using an asset and liability method whereby deferred tax assets are recognized for deductible temporary differences and operating loss carryforwards and deferred tax liabilities are

recognized for taxable temporary differences. Temporary differences are the differences between the reported amounts of assets and liabilities and their tax basis. Deferred tax assets are reduced by a valuation allowance when, in our opinion, it is more likely than not that some portion or all of the deferred tax assets will not be realized. Deferred tax assets and liabilities are adjusted for the effects of changes in tax laws and rates on the date of enactment.

We recognize deferred tax liabilities related to taxes on certain foreign earnings that were not considered to be permanently reinvested. No deferred tax liabilities were recognized for foreign earnings that were considered to be permanently reinvested. We regularly evaluate whether foreign earnings are expected to be permanently reinvested. This evaluation requires judgment about our future operating and liquidity needs. Changes in economic and business conditions, foreign or U.S. tax laws, or our financial situation could result in changes to these judgments and the need to record additional tax liabilities.

We are regularly audited by foreign and domestic tax authorities. These audits occasionally result in proposed assessments where the ultimate resolution might result in us owing additional taxes, including in some cases, penalties and interest. We recognize a tax position in our financial statements when it is more likely than not (i.e., a likelihood of more than fifty percent) that the position would be sustained upon examination by tax authorities. This recognized tax position is then measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. Although we believe that our estimates are reasonable, the final outcome of uncertain tax positions may be materially different from that which is reflected in our financial statements. We adjust such reserves upon changes in circumstances that would cause a change to the estimate of the ultimate liability, upon effective settlement or upon the expiration of the statute of limitations, in the period in which such event occurs. See Note 11, Income Taxes, for further discussion.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Note 2. Discontinued Operations

On October 1, 2016, we completed the Separation and Distribution. Immediately following the Distribution, we held approximately 6.2 million shares of Donnelley Financial Solutions common stock and approximately 6.2 million shares of LSC common stock. We accounted for these investments as available-for-sale equity securities. In March 2017, we sold the 6.2 million shares of LSC common stock we retained upon spinoff for net proceeds of $121.4 million, resulting in a realized loss of $51.6 million, which was recorded within net investment and other income in the Consolidated Statements of Operations for the year ended December 31, 2017. In June 2017, we completed a non-cash debt-for-equity exchange in which we exchanged 6.1 million of our retained shares of Donnelley Financial common stock for the extinguishment of $111.6 million in aggregate principal amount of our indebtedness, resulting in a realized net gain of $92.4 million, which was recorded within net investment and other income in the Consolidated Statements of Operations for the year ended December 31, 2017. In August 2017, we disposed of our remaining 0.1 million shares of Donnelley Financial common stock in exchange for the extinguishment of $1.9 million in aggregate principal amount of our indebtedness, resulting in a realized net gain of $1.6 million. See Note 12, Debt, for further discussion of these debt-for-equity transactions.

In conjunction with the Separation, we entered into certain agreements with Donnelley Financial and LSC to implement the legal and structural separation from Donnelley Financial and LSC, govern the relationship between RRD, Donnelley Financial and LSC up to and after the completion of the Separation, and allocate between RRD, Donnelley Financial and LSC various assets, liabilities and obligations, including, among other things, employee benefits, intellectual property and tax-related assets and liabilities. These agreements included the Separation and Distribution Agreement, Transition Services Agreement, Tax Disaffiliation Agreement, Patent Assignment and License Agreement, Trademark Assignment and License Agreement, Data Assignment and License Agreement, Software, Copyright and Trade Secret Assignment and License Agreement, Stockholder and Registration Rights Agreement and commercial and other arrangements and agreements.

Sales from RRD to Donnelley Financial and LSC previously eliminated in consolidation have been recast and are shown as external sales within the financial results of continuing operations. The net sales were $150.4 million for the year ended December 31, 2016. Interest expense was allocated to discontinued operations for interest expense directly attributable to the operations of the discontinued operations and interest expense related to corporate level debt that was repurchased in conjunction with the spinoff transactions.

The following table presents the financial results of discontinued operations for the year ended December 31, 2016:

Net sales	$3,303.4
Cost of sales	2,534.7
Operating expenses [(a)]	615.9
Interest and other expense, net [(b)]	151.4
Earnings before income taxes	1.4
Income tax expense	11.1
Net loss from discontinued operations	$(9.7)

(a) Includes spinoff transaction costs incurred of $81.2 million.

(b) Includes the related interest expense of the corporate level debt which was retired in connection with the Separation totaling $55.9 million for the year ended December 31, 2016. Also includes the losses on the extinguishment of corporate level debt executed in conjunction with the spinoff transactions totaling $96.1 million for the year ended December 31, 2016.

The following table presents the significant non-cash items and capital expenditures of discontinued operations for the year ended December 31, 2016:

Depreciation and amortization	$159.0
Pension settlement charges	77.7
Impairment charges	1.5
Loss on debt extinguishments	96.1
Assumption of warehousing equipment related to client contract	8.8
Purchase of property, plant and equipment	(49.0)

In connection with the Separation, we entered into transition services agreements with Donnelley Financial and LSC, under which the companies will provide one another with certain services to help ensure an orderly transition following the Separation (the "Transition Services Agreements"). The charges for these services are intended to allow the companies, as applicable, to recover the direct and indirect costs incurred in providing such services. The Transition Services Agreements generally provide for a term of services starting at the Separation date and continuing for a period of up to 24 months following the Separation. We recognized $4.0 million, $7.7 million and $3.3 million for the years ended December 31, 2018, 2017 and 2016, respectively, as a reduction of costs within selling, general and administrative expenses from the Transition Services Agreement.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We also entered into various commercial agreements which govern sales transactions between the companies. Under these commercial agreements, we recognized the following transactions with LSC and Donnelley Financial during the years ended December 31, 2017 and 2016.

	Year ended December 31,	
	2017	2016
Net sales to LSC and Donnelley Financial	$279.5	$98.0
Purchases from LSC and Donnelley Financial	159.4	79.0

We also recognized $126.1 million and $17.8 million of net cash inflow from Donnelley Financial and LSC within operating activities in the Consolidated Statements of Cash Flows during the years ended December 31, 2017 and 2016, respectively.

Note 3. Dispositions and Acquisition

2018 Disposition

On July 2, 2018, we completed the sale of our Print Logistics business for $60.0 million cash, of which we received $43.9 million after transaction costs, working capital adjustments and $4.9 million of cash which was included in the disposition. Net proceeds from the sale were used to reduce borrowings outstanding on our credit facility. The disposition resulted in a pre-tax gain of $3.6 million during 2018, which was recorded in Other operating income in the Consolidated Statements of Operations. Income taxes paid as a result of the sale were insignificant due to the utilization of capital loss carryforwards to offset the taxable gain. Prior to the sale, operating results for the Print Logistics business were reported as services within the Business Services segment.

2016 Acquisition

On August 4, 2016, we acquired Precision Dialogue Holdings, LLC (“Precision Dialogue”), a provider of email marketing, direct mail marketing and other services with operations in the United States for a purchase price, net of cash acquired, of approximately $59.2 million. The acquisition expanded our ability to help our clients measure communications effectiveness and audience engagement. During the year ended December 31, 2016, Precision Dialogue contributed $22.4 million in net sales and earnings before income taxes of $1.8 million.

For the year ended December 31, 2016, we recorded $2.7 million of acquisition-related expenses, respectively, associated with completed or contemplated acquisitions within Selling, general and administrative expenses in the Consolidated Statements of Operations.

2016 Dispositions

During 2016, we sold five insignificant entities within the Business Services segment for net proceeds of $13.7 million, all of which was received in 2016. The dispositions of these entities resulted in a net gain of $11.9 million

during the period ended December 31, 2016, which was recorded in Other operating income in the Consolidated Statements of Operations.

Note 4. Revenue Recognition

On January 1, 2018, we adopted ASC Topic 606, “Revenue from Contracts with Customers” using the modified retrospective method applied to those contracts which were not completed as of January 1, 2018. Results for reporting periods beginning after January 1, 2018 are presented under Topic 606, while prior period amounts are not adjusted and continue to be reported in accordance with our historical accounting under Topic 605. All revenue recognized in the Consolidated Statements of Operations is considered to be revenue from contracts with clients.

We recorded a net increase to opening retained earnings of $12.9 million as of January 1, 2018 due to the cumulative impact of adopting Topic 606, with the impact primarily related to the timing of revenue recognition for certain inventory that has been billed but not yet shipped.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Disaggregation of Revenue

The following table presents net sales disaggregated by products and services:

	2018	2017	2016
Products			
Commercial print	$1,935.6	$2,114.0	$2,072.5
Packaging	672.0	562.1	459.3
Statements	584.2	556.4	561.3
Direct marketing	581.6	545.7	537.4
Labels	481.4	470.4	472.1
Digital print and fulfillment	474.4	478.0	471.9
Supply chain management	321.0	314.9	321.7
Forms	267.5	284.5	329.2
Total products net sales	$5,317.7	$5,326.0	$5,225.4
Services			
Logistics	$1,109.3	$1,238.2	$1,236.1
Business process outsourcing	248.1	222.2	228.9
Digital and creative solutions	125.1	153.2	142.6
Total services net sales	$1,482.5	$1,613.6	$1,607.6
Total net sales	$6,800.2	$6,939.6	$6,833.0

Products

Our products revenue is primarily recognized at a point in time. We generally recognize revenue for products upon the transfer of control of the products to the client which typically occurs upon transfer of title and risk of ownership, which is generally upon shipment to the client. For certain products, we are able to recognize revenue for completed inventory billed but not yet shipped at the client’s direction.

The following is a description of our products:

Commercial Print

We generate revenue by providing various commercial printing products and offer a full range of branded materials including manuals, publications, brochures, business cards, flyers, post cards, posters and promotional items.

Packaging

We generate revenue by providing packaging solutions, ranging from rigid boxes to in-box print materials, for clients in consumer electronics, life sciences, cosmetics and consumer packaged goods industries.

Statements

We generate revenue by creating critical business communications, including customer billings, financial statements, healthcare communications and insurance documents. Our capabilities include design and composition, variable imaging, email, archival and digital mail interaction, as well as our innovative RRDigital solution set.

Direct Marketing

We generate revenue by providing audience segmentation, creative development, program testing, print production, postal optimization and performance analytics for large-scale personalized direct mail programs.

Labels

We generate revenue by producing custom labels for clients across multiple industries including warehouse and distribution, retail, pharmaceutical, manufacturing and consumer packaging. We offer distribution and shipping labels, healthcare and durable goods labels, promotional labels and consumer product goods packaging labels.

Digital Print and Fulfillment

We generate revenue by providing in-store marketing materials, including signage and point-of-purchase materials, as well as custom marketing kits that require multiple types of marketing collateral. Under the trade name Motif™, we also create custom photobooks.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Supply Chain Management

We generate revenue by providing workflow design to assembly, configuration, kitting and fulfillment for clients in consumer electronics, telecommunications, life sciences, cosmetics, education and industrial industries.

Forms

We generate revenue by producing a variety of forms including invoices, order forms and business forms that support both the private and public sectors for clients in financial, government, retail, healthcare and business services industries.

Services

Our services revenue is recognized both at a point in time and over time. Our logistics revenue is primarily recognized over time as the performance obligation is completed. Due to the short transit period of logistics performance obligations, the timing of revenue recognition does not require significant judgment. Our business process outsourcing and digital and creative solutions revenue is recognized over time or at a point in time, depending on the nature of the service which could be either recurring or project-based.

Logistics

We generate revenue by providing specialized transportation and distribution services using our third party logistics solutions. These services are comprised of freight services, including truckload, less-than-truckload, intermodal and international freight forwarding; international mail and parcel distribution; and courier services including same day and next day delivery. As discussed in Note 3, Dispositions and Acquisition, we sold our Print Logistics business on July 2, 2018. Print Logistics services included the distribution of retail and newsstand printed materials.

Business Process Outsourcing

We generate revenue by providing outsourcing services including creative services, research and analytics, financial management and other services for legal providers, insurance, telecommunications, utilities, retail and financial services companies.

Digital and Creative Solutions

We generate revenue by creating and managing content for delivery across multiple marketing communications channels including print and digital advertising, direct marketing and mail, packaging, sales collateral, in-store marketing and social media.

Variable Consideration

Certain clients may receive volume-based rebates or early payment discounts, which are accounted for as variable consideration. We estimate these amounts based on the expected amount to be earned by our clients and reduce

revenue accordingly. We do not expect significant changes to estimates of variable consideration. Given the nature of our products and the history of returns, product returns are not significant.

Contract Balances

The following table provides information about contract assets and liabilities from contracts with clients:

	Contract Assets	Contract Liabilities	
	Short-Term	Short-Term	Long-Term
Balance at January 1, 2018	$ 4.0	$30.3	$ 1.4
Balance at December 31, 2018	2.7	16.5	0.6

Contract liabilities primarily relate to client advances received prior to completion of performance obligations. Reductions in contract liabilities are a result of our completion of performance obligations.

Revenue recognized during the year ended December 31, 2018 from amounts included in contract liabilities at the beginning of the period was approximately $23.5 million. During the year ended December 31, 2018, we reclassified $4.0 million of contract assets included at the beginning of the period to receivables as a result of the completion of the performance obligation and the right to the consideration becoming unconditional.

Practical Expedients and Exemptions

As part of the adoption of Topic 606, we have elected practical expedients and exemptions allowable under the guidance.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We account for shipping and handling activities performed after the control of a good has been transferred to the client as a fulfillment cost. We accrue for the costs of shipping and handling activities if revenue is recognized before contractually agreed shipping and handling activities occur.

We apply Topic 606 to a portfolio of contracts (or performance obligations) with similar characteristics as we reasonably expect that the effects on the financial statements of applying this guidance to the portfolio would not differ significantly from applying this guidance to the individual contracts (or performance obligations) within that portfolio.

When the output method for measure of progress is determined appropriate, we recognize revenue in the amount for which we have the right to invoice for revenue that is recognized over time and for which we can demonstrate that the invoiced amount corresponds directly with the value to the client for the performance completed to date.

We generally expense sales commissions and other costs to obtain a contract when incurred, because the amortization period would have been one year or less. These costs are recorded within Selling, general and administrative expenses.

We exclude sales taxes and other similar taxes from the measurement of the transaction price. We do not disclose the value of unsatisfied performance obligations, nor do we disclose the timing of revenue recognition for contracts with an original expected length of one year or less.

Note 5. Restructuring, Impairment and Other Charges

For the year ended December 31, 2018, we recorded the following net restructuring, impairment and other charges:

	Employee Terminations	Other Restructuring Charges	Total Restructuring Charges	Impairment and Other	Multi-Employer Pension Plan Charges	Total
Business Services	$ 10.1	$ 9.0	$ 19.1	$ 4.8	$ 1.9	$25.8
Marketing Solutions	2.0	—	2.0	1.5	0.4	3.9
Corporate	0.8	7.6	8.4	0.7	—	9.1
Total	$ 12.9	$ 16.6	$ 29.5	$ 7.0	$ 2.3	$38.8

Restructuring, Impairment and Other Charges

For the year ended December 31, 2018, we recorded net restructuring charges of $12.9 million for employee termination costs. These charges primarily related to the reorganization of selling, general and administrative functions across each segment and four announced facility closures in the Business Services segment. We also incurred lease termination and other restructuring charges of $16.6 million for the year ended December 31, 2018. For the year ended December 31, 2018, we recorded impairment charges of $13.7 million related to long-lived assets which were written down to their implied fair value of zero, primarily due to facility closures. Additionally, we

recorded a $6.7 million net gain on the sale of previously impaired assets in the Business Services segment for the year ended December 31, 2018. The majority of these assets were previously impaired in 2015.

Multi-Employer Pension Plan (MEPP) Charges

For the year ended December 31, 2018, we recorded charges of $2.3 million for MEPP withdrawal obligations unrelated to facility closures. We made contributions of $5.1 million to these plans during the year ended December 31, 2018. The total liabilities for the withdrawal obligations associated with our decision to withdraw from all MEPPs included in Accrued liabilities and other and Other noncurrent liabilities are $5.1 million and $28.9 million, respectively, as of December 31, 2018. See Note 10, Retirement Plans, for further discussion of MEPPs.

Our MEPP withdrawal liabilities could be affected by the financial stability of other employers participating in the plans and any decisions by those employers to withdraw from the plans in the future. While it is not possible to quantify the potential impact of future events or circumstances, reductions in other employers' participation in MEPPs, including certain plans from which we have previously withdrawn, could have a material impact on our previously estimated withdrawal liabilities, consolidated results of operations, financial position or cash flows.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

For the year ended December 31, 2017, we recorded the following net restructuring, impairment and other charges:

	Employee Terminations	Other Restructuring Charges	Total Restructuring Charges	Impairment and Other	MEPP Charges	Total
Business Services	$ 12.1	$ 3.7	$ 15.8	$ 0.1	$ 1.9	$ 17.8
Marketing Solutions	2.7	0.3	3.0	21.9	0.4	25.3
Corporate	8.7	0.8	9.5	0.4	—	9.9
Total	$ 23.5	$ 4.8	$ 28.3	$ 22.4	$ 2.3	$ 53.0

Restructuring, Impairment and Other Charges

For the year ended December 31, 2017, we recorded net restructuring charges of $23.5 million for employee termination costs. These charges primarily related to the reorganization of selling, general and administrative functions across each segment, ceasing our relationship in a joint venture within the Business Services segment and a facility closure in the Marketing Solutions segment. We also incurred lease termination and other restructuring charges of $4.8 million for the year ended December 31, 2017.

Additionally in the year ended December 31, 2017, we recorded net impairment charges of $22.4, primarily related to the $21.3 million impairment of goodwill within the Marketing Solutions segment. The goodwill impairment charge was due to a major client beginning to transition their business away during the fourth quarter of 2017, as well as declines in sales with other existing clients which resulted in lower expectations of future revenues, profitability and cash flows. The goodwill impairment charges were determined using Level 3 inputs, including comparable marketplace fair value data and a discontinued cash flow analysis. The remaining impairment charges recorded for the year ended December 31, 2017, were primarily due to the impairment of equipment and software associated with the facility closure in the Marketing Solutions segment.

MEPP Charges

For the year ended December 31, 2017, we recorded charges of $2.3 million for MEPP withdrawal obligations unrelated to facility closures. We made contributions of $5.1 million to these plans during the year ended December 31, 2017. The total liabilities for the withdrawal obligations associated with our decision to withdraw from all MEPPs included in Accrued liabilities and other and Other noncurrent liabilities are $5.1 million and $31.7 million, respectively, as of December 31, 2017. See Note 10, Retirement Plans, for further discussion of MEPPs.

For the year ended December 31, 2016, we recorded the following net restructuring, impairment and other charges:

	Employee	Total	Total

	Terminations	Other Restructuring Charges	Restructuring Charges	Impairment and Other	MEPP Charges	
Business Services	$ 11.1	$ 3.4	$ 14.5	$ 384.5	$ 1.9	$400.9
Marketing Solutions	1.7	—	1.7	170.9	0.4	173.0
Corporate	9.1	0.1	9.2	1.2	—	10.4
Total	$ 21.9	$ 3.5	$ 25.4	$ 556.6	$ 2.3	$584.3

Restructuring, Impairment and Other Charges

For the year ended December 31, 2016, we recorded net restructuring charges of $21.9 million for employee termination costs. These charges primarily related to the reorganization of certain corporate administrative functions and operations and two facility closures in the Business Services segment. We also incurred lease termination and other restructuring charges of $3.5 million for the year ended December 31, 2016.

Additionally, in the year ended December 31, 2016, we recorded net impairment charges of $556.6, primarily related to the $527.8 million impairment of goodwill in both the Business Services and Marketing Solutions segments. The goodwill impairment charges were due to the continued declines in sales, primarily due to decreased volume, which resulted in a reduction in the estimated fair value of the reporting units based on lower expectations of future revenue, profitability and cash flows. The goodwill impairment charges were determined using the Level 3 inputs, including discounted cash flow analysis, comparable marketplace fair value data and management’s assumptions in valuing the significant tangible and intangible assets. The remaining charges for the year ended December 31, 2016, included a $29.7 million impairment charge for certain acquired client relationship intangible assets in both the Business Services and Marketing Solutions segments and $0.9 million of net gains on the sale of previously impaired assets. The impairment of the client relationship intangible assets resulted from lower expectations of future revenue to be derived from those relationships and was determined using Level 3 inputs and estimated based on cash flow analyses, which included management’s assumptions related to future revenues and profitability.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

MEPP Charges

For the year ended December 31, 2016, we recorded $2.3 million for MEPP withdrawal obligations unrelated to facility closures.

Restructuring Reserve

The restructuring reserve as of December 31, 2018 and 2017, and changes during the year ended December 31, 2018, were as follows:

	December 31, 2017	Restructuring Charges	Foreign Exchange and Other	Cash Paid	December 31, 2018
Employee terminations	$ 9.6	$ 12.9	$ (1.5)	$(16.2)	$ 4.8
MEPP withdrawal obligations	11.0	0.7	—	(1.5)	10.2
Lease terminations and other	2.9	15.9	2.4	(15.0)	6.2
Total	$ 23.5	$ 29.5	$ 0.9	$(32.7)	$ 21.2

The current portion of restructuring reserves of $9.1 million at December 31, 2018 was included in Accrued liabilities and other, while the long-term portion of $12.1 million, primarily related to MEPP withdrawal obligations related to facility closures, employee terminations in litigation, environmental reserves and lease termination costs, was included in Other noncurrent liabilities at December 31, 2018.

We anticipate that payments associated with the employee terminations reflected in the above table will be substantially completed by December 2019, excluding employee terminations in litigation within the Business Services segment.

Payments on all of our MEPP withdrawal obligations are scheduled to be substantially completed by 2034. Changes based on uncertainties in these estimated withdrawal obligations could affect the ultimate charges related to MEPP withdrawals. See Note 10, Retirement Plans, for further discussion on MEPPs.

The restructuring liabilities classified as “lease terminations and other” consisted of lease terminations, other facility closing costs and contract termination costs. Payments on certain of the lease obligations are scheduled to continue until 2020. Market conditions and our ability to sublease these properties could affect the ultimate charges related to the lease obligations. Any potential recoveries or additional charges could affect amounts reported in our consolidated financial statements.

The restructuring reserve as of December 31, 2017 and 2016, and changes during the year ended December 31, 2017, were as follows:

	December 31, 2016	Restructuring Charges	Foreign Exchange and Other	Cash Paid	December 31, 2017
Employee terminations	$ 7.6	$ 23.5	$ 0.1	$(21.6)	$ 9.6
MEPP withdrawal obligations	11.8	0.7	—	(1.5)	11.0
Lease terminations and other	1.6	4.1	1.0	(3.8)	2.9
Total	$ 21.0	$ 28.3	$ 1.1	$(26.9)	$ 23.5

The current portion of restructuring reserves of $10.7 million at December 31, 2017 was included in Accrued liabilities and other, while the long-term portion of $12.8 million, primarily related to MEPP withdrawal obligations related to facility closures, employee terminations in litigation and lease termination costs, was included in Other noncurrent liabilities at December 31, 2017.

Payments associated with the employee terminations reflected in the above table were substantially completed by December 2018, excluding employee terminations in litigation within the Business Services segment.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Note 6. Goodwill and Other Intangible Assets

The changes in the carrying amount of goodwill for the years ended December 31, 2018 and 2017 were as follows:

	Business Services	Marketing Solutions	Total
Net book value as of January 1, 2017			
Goodwill	2,686.6	519.5	3,206.1
Accumulated impairment losses	(2,371.3)	(232.8)	(2,604.1)
Total	$315.3	$ 286.7	$602.0
Foreign exchange and other adjustments	7.8	—	7.8
Impairment charges	—	(21.3)	(21.3)
Net book value as of December 31, 2017			
Goodwill	2,759.8	519.5	3,279.3
Accumulated impairment losses	(2,436.7)	(254.1)	(2,690.8)
Total	$323.1	$ 265.4	$588.5
Disposition	(32.4)	—	(32.4)
Foreign exchange and other adjustments	(2.7)	—	(2.7)
Net book value as of December 31, 2018			
Goodwill	2,604.3	519.5	3,123.8
Accumulated impairment losses	(2,316.3)	(254.1)	(2,570.4)
Total	$288.0	$ 265.4	$553.4

During the year ended December 31, 2018, we reduced goodwill by $32.4 million for the disposition of our Print Logistics business. See Note 3, Dispositions and Acquisition, for further discussion on the disposition and see Note 5, Restructuring, Impairment and Other Charges, for further discussion regarding goodwill impairment charges.

The components of other intangible assets at December 31, 2018 and 2017 were as follows:

	December 31, 2018			December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Book Value	Gross Carrying Amount	Accumulated Amortization	Net Book Value
Client relationships	$520.3	$ (425.5)	$94.8	$534.1	$ (412.4)	$121.7
Patents	2.0	(2.0)	—	2.0	(2.0)	—
Trademarks, licenses and agreements	25.7	(25.2)	0.5	26.2	(25.2)	1.0
Trade names	34.6	(16.6)	18.0	36.8	(16.2)	20.6
Total other intangible assets	$582.6	$ (469.3)	$113.3	$599.1	$ (455.8)	$143.3

Amortization expense for other intangible assets was $27.5 million, $28.6 million and $33.7 million for the years ended December 31, 2018, 2017 and 2016, respectively.

The following table outlines the estimated annual amortization expense related to other intangible assets as of December 31, 2018:

	Amount
2019	$ 23.4
2020	19.6
2021	19.4
2022	19.3
2023	19.2
2024 and thereafter	12.4
Total	$ 113.3

Note 7. Fair Value Measurement

Certain assets and liabilities are required to be recorded at fair value on a recurring basis. See Note 13, Derivatives, for further discussion on financial assets and liabilities that are carried at fair value on a recurring basis in the Consolidated Balance Sheets.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

In addition to assets and liabilities that are recorded at fair value on a recurring basis, we are required to record certain assets and liabilities at fair value on a nonrecurring basis, generally as a result of acquisitions or the remeasurement of assets resulting in impairment charges.

The fair value as of the measurement date, net book value as of the end of the year and related impairment charge for assets measured at fair value on a nonrecurring basis subsequent to initial recognition during the years ended December 31, 2018, 2017 and 2016 were as follows:

	Year Ended December 31, 2018		As of December 31, 2018	
	Impairment Charge	Fair Value Measurement (Level 3)	Net Book Value	
Long-lived assets	$ 13.7	$ —	$	—
Other intangible assets	0.2	—		—
Total	$ 13.9	$ —	$	—

	Year Ended December 31, 2017		As of December 31, 2017	
	Impairment Charge	Fair Value Measurement (Level 3)	Net Book Value	
Long-lived assets	$ 1.3	$ 0.7	$	—
Goodwill	21.3	—		—
Other intangible assets	0.2	—		—
Total	$ 22.8	$ 0.7	$	—

	Year Ended December 31, 2016		As of

		December 31, 2016	
	Impairment Charge	Fair Value Measurement (Level 3)	Net Book Value
Long-lived assets	$0.6	$ —	$ —
Goodwill	527.8	15.2	15.2
Other intangible assets	29.7	4.6	4.3
Total	$558.1	$ 19.8	$ 19.5

See Note 5, Restructuring, Impairment and Other Charges, for further discussion regarding impairment charges recorded for long-lived assets, goodwill and other intangible assets which were written down to their implied fair values during the years ended December 31, 2018, 2017 and 2016.

Our accounting and finance management determines the valuation policies and procedures for Level 3 fair value measurements and is responsible for the development and determination of unobservable inputs.

The fair values of the long-lived assets held and used and long-lived assets held for sale or disposal were determined using Level 3 inputs and were estimated based on discussions with real estate brokers, review of comparable properties, if available, discussions with machinery and equipment brokers, dealer quotes and internal expertise related to the current marketplace conditions. Unobservable inputs obtained from third parties are adjusted as necessary for the condition and attributes of the specific asset.

Note 8. Accrued Liabilities and Other

The components of accrued liabilities and other at December 31, 2018 and 2017 were as follows:

	2018	2017
Employee-related liabilities	$177.8	$173.0
Deferred revenue	16.5	112.4
Restructuring liabilities	9.1	10.7
Other	144.0	151.4
Total accrued liabilities and other	$347.4	$447.5

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Employee-related liabilities consist primarily of payroll, sales commission, incentive compensation, employee benefit accruals and workers' compensation. Incentive compensation accruals include amounts earned pursuant to our primary employee incentive compensation plans. Other accrued liabilities include miscellaneous operating accruals, withdrawal obligations associated with MEPPs, other client-related liabilities, interest expense accruals and income and other tax liabilities. Reduction in deferred revenue at December 31, 2018 compared to December 31, 2017 is attributable to the adoption of ASC Topic 606, "Revenue from Contracts with Customers."

Note 9. Commitments and Contingencies

As of December 31, 2018, we had commitments of approximately $45.0 million for the purchase of property, plant and equipment related to incomplete projects. We also have contractual commitments of approximately $52.5 million for outsourced services, including technology, professional, maintenance and other services. We have a variety of contracts with suppliers for the purchase of paper, ink and other commodities for delivery in future years at prevailing market prices.

Future minimum rental commitments under operating leases are as follows:

Year Ended December 31	Amount
2019	$ 77.8
2020	56.9
2021	41.3
2022	27.7
2023	21.4
2024 and thereafter	33.4
	$ 258.5

We have operating lease commitments, including those for vacated facilities, totaling $258.5 million extending through various periods to 2028. Future rental commitments for leases have not been reduced by minimum non-cancelable sublease rentals aggregating approximately $7.6 million. We remain secondarily liable under these leases in the event that the sub-lessee defaults under the sublease terms. We do not believe that material payments will be required as a result of the secondary liability provisions of the primary lease agreements.

Rent expense for facilities in use and equipment was $110.0 million, $118.3 million and $117.6 million for the years ended December 31, 2018, 2017 and 2016, respectively. Rent expense for vacated facilities was recognized as net restructuring, impairment and other charges. See Note 5, Restructuring, Impairment and Other Charges, for further discussion.

Litigation

We are subject to laws and regulations relating to the protection of the environment. We provide for expenses associated with environmental remediation obligations when such amounts are probable and can be reasonably estimated. Such accruals are adjusted as new information develops or circumstances change and are generally not discounted. We have been designated as a potentially responsible party or have received claims in two active federal and state Superfund and other multiparty remediation sites. In addition to these sites, we may also have the obligation to remediate six other previously and currently owned facilities. At the Superfund sites, the Comprehensive Environmental Response, Compensation and Liability Act provides that our liability could be joint and several, meaning that we could be required to pay an amount in excess of our proportionate share of the remediation costs.

Our understanding of the financial strength of other potentially responsible parties at the multiparty sites and of other liable parties at the previously owned facilities has been considered, where appropriate, in the determination of our estimated liability. We believe that our recorded reserves, recorded in Accrued liabilities and other and Other noncurrent liabilities, are adequate to cover our share of the potential costs of remediation at each of the multiparty sites and the previously and currently owned facilities. It is not possible to quantify with certainty the potential impact of actions regarding environmental matters, particularly remediation and other compliance efforts that we may undertake in the future. However, in our opinion, compliance with the present environmental protection laws, before taking into account estimated recoveries from third parties, will not have a material effect on our consolidated results of operations, financial position or cash flows.

From time to time, our clients and others file voluntary petitions for reorganization under United States bankruptcy laws. In such cases, certain pre-petition payments received by us from these parties could be considered preference items and subject to return. In addition, we may be party to certain litigation arising in the ordinary course of business. We believe that the final resolution of these preference items and litigation will not have a material effect on our consolidated results of operations, financial position or cash flows.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Note 10. Retirement Plans

We sponsor various defined benefit retirement income pension plans in the U.S., U.K., Canada and certain other international locations, including both funded and unfunded arrangements. Our primary defined benefit plans are frozen. No new employees will be permitted to enter our frozen plans and participants will earn no additional benefits. Benefits are generally based upon years of service and compensation. These defined benefit retirement income plans are funded in conformity with the applicable government regulations. We fund at least the minimum amount required for all funded plans using actuarial cost methods and assumptions acceptable under government regulations.

Prior to the Separation, certain of our active and retired employees participated in our sponsored benefit plans. Following the Separation, their benefits are now provided directly by Donnelley Financial or LSC. As a result of the spinoff, the related plan obligations and plan assets were remeasured as of September 30, 2016 and transferred to Donnelley Financial or LSC on October 1, 2016. The transfer of these benefits to Donnelley Financial and LSC reduced our benefit plan liabilities by $426.5 million, deferred tax assets of $351.3 million and accumulated other comprehensive losses by $906.1 million. In accordance with the Separation and Distribution Agreement, we recorded the final pension asset valuation adjustment during 2017 resulting in a pre-tax decrease of $5.8 million ($3.6 million after-tax) to our pension liability.

In the fourth quarter of 2015, we communicated to certain former employees the option to receive a lump-sum pension payment or annuity with payments computed in accordance with statutory requirements, beginning in the second quarter of 2016. Payments to eligible participants who elected to receive a lump-sum pension payment or annuity were funded from existing pension plan assets and constituted a complete settlement of our pension liabilities with respect to these participants. Our pension assets and liabilities were remeasured as of the payout date. The discount rates and actuarial assumptions used to calculate the payouts were determined in accordance with federal regulations. As of the remeasurement date, the reduction in the reported pension obligation for these participants was $354.8 million, compared to payout amounts of approximately $328.4 million. We recorded non-cash settlement charges of $21.1 million within net investment and other income and $77.7 million within net earnings from discontinued operations during the period ended December 31, 2016 in connection with the settlement payments. These charges resulted from the recognition in earnings of a portion of the actuarial losses recorded in accumulated other comprehensive loss based on the proportion of the obligation settled.

We made contributions of $10.7 million to our pension plans and $7.2 million to our OPEB plans during the year ended December 31, 2018. We expect to make cash contributions of approximately $8.0 million to our pension and OPEB plans in 2019.

In addition to the pension plans, we sponsor a 401(k) savings plan, which is a defined contribution retirement income plan.

Former employees are entitled to certain healthcare and life insurance benefits provided they have met certain eligibility requirements. Generally, our benefits-eligible U.S. employees become eligible for these retiree healthcare benefits if they meet all of the following requirements at the time of termination: (a) have attained at least 55 or more points (full years of service and age combined), (b) are at least fifty years of age, (c) have at least two years of continuous, regular, full-time, benefits-eligible service and (d) have completed at least two or more years of

continuous service with a participating employer, which ends on their termination date. Different requirements need to be met in order to receive subsidized medical and life insurance coverage. Certain of the plan expenses are paid through a tax-exempt trust. Most of the assets of the trust are invested in trust-owned life insurance policies covering certain current and former employees of ours. The underlying assets of the policies are invested primarily in marketable equity, corporate fixed income and government securities.

During the third quarter of 2016, we announced the discontinuation of retiree medical, prescription drug and life insurance benefits for individuals retiring on or after October 1, 2016. This change was accounted for as a significant plan amendment and the other postemployment benefit plan obligations were remeasured as of September 30, 2016. This remeasurement resulted in a reduction to the other postemployment benefit plan obligations of $35.0 million and a curtailment gain of $19.5 million recorded within net investment and other income during the year ended December 31, 2016.

During the fourth quarter of 2018, we amended our Canadian OPEB plan requiring costs to increasingly be borne by retirees over the next three years until the full cost of these benefits is borne by plan participants in 2021. As a result, we reduced our OPEB liability by $31.1 million during the year ended December 31, 2018.

We operate a prescription drug program for certain Medicare-eligible retirees under a group-based Company-sponsored Medicare Part D program, or Employer Group Waiver Program (“EGWP”). The EGWP subsidies provided to or for the benefit of this program are used to reduce our net retiree medical and prescription drug costs on a group by group basis until such net costs of ours for such group are eliminated, and any EGWP subsidies received in excess of the amount necessary to offset such net costs are used to reduce the included group of retirees’ premiums.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We also maintain several pension and OPEB plans in certain international locations. The expected returns on plan assets and discount rates for these plans are determined based on each plan's investment approach, local interest rates and plan participant profiles.

The pension and OPEB plan obligations are calculated using generally accepted actuarial methods and are measured as of December 31. Prior to the plan freezes, actuarial gains and losses were amortized using the corridor method over the average remaining service life of active plan participants. Actuarial gains and losses for frozen plans are amortized using the corridor method over the average remaining expected life of active plan participants.

The components of the net periodic benefit (income) expense and total (income) expense were as follows:

	Pension Benefits			OPEB		
	2018	2017	2016	2018	2017	2016
Service cost	$0.7	$0.7	$1.0	$(3.7)	$1.3	$3.8
Interest cost	31.3	31.6	105.7	9.4	11.1	11.7
Expected return on plan assets	(50.3)	(50.3)	(177.5)	(13.9)	(13.5)	(13.8)
Amortization of prior service credit	—	—	—	(3.3)	(2.8)	(12.7)
Amortization of actuarial loss (gain)	7.9	7.3	26.1	(0.6)	(0.1)	0.1
Settlements and curtailments	1.9	1.6	98.4	—	—	(19.5)
Attributable to DFS and LSC	—	—	(43.3)	—	—	—
Net periodic benefit (income) expense related to continuing operations	$(8.5)	$(9.1)	$10.4	$(12.1)	$(4.0)	$(30.4)
Weighted average assumption used to calculate net periodic benefit expense:						
Discount rate	3.4%	3.8%	4.3%	3.5%	4.0%	4.2%
Expected return on plan assets	5.5%	5.9%	6.8%	6.8%	6.8%	7.3%

We adopted ASU No. 2017-07 "Compensation—Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost", with retrospective adoption, during the first quarter of 2018. In accordance with Topic 715, benefit service cost is recorded in cost of sales and selling, general and administrative expenses. The other components, which include interest cost, expected return on plan assets, net amortization and settlements, are recorded in net investment and other income within the Consolidated Statements of Operations. Previously, all pension and postretirement benefits expense (income) was recorded in cost of sales and selling, general and administrative expenses. See Note 18, New Accounting Pronouncements, for further discussion and impact of adoption.

	Pension Benefits		OPEB	
	2018	2017	2018	2017
Benefit obligation at beginning of year	$1,044.8	$974.7	$342.4	$345.0

Service cost	0.7	0.7	(3.7)	1.3
Interest cost	31.3	31.6	9.4	11.1
Plan participants' contributions	—	—	10.1	9.0
Medicare reimbursements	—	—	6.4	5.0
Actuarial (gain) loss	(64.3)	53.9	(19.7)	3.0
Plan amendments and other	0.7	—	(32.6)	—
Settlements	(8.5)	(5.9)	—	—
Foreign currency translation	(26.5)	34.4	(1.3)	2.8
Benefits paid	(45.2)	(44.6)	(33.9)	(34.8)
Benefit obligation at end of year	$933.0	$1,044.8	$277.1	$342.4
Fair value of plan assets at beginning of year	$979.3	$875.4	$228.6	$210.3
Actual (loss) return on assets	(31.7)	106.0	(9.5)	31.3
Settlements	(8.7)	(6.3)	—	—
Employer contributions	10.7	8.6	7.2	7.8
Medicare reimbursements	—	—	6.4	5.0
Plan participants' contributions	—	—	10.1	9.0
Separation of Donnelley Financial and LSC	—	5.8	—	—
Foreign currency translation	(25.6)	34.4	—	—
Benefits paid	(45.2)	(44.6)	(33.9)	(34.8)
Fair value of plan assets at end of year	$878.8	$979.3	$208.9	$228.6
Total net pension and OPEB liability recognized as of December 31	$(54.2)	$(65.5)	$(68.2)	$(113.8)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

The accumulated benefit obligation for all defined benefit pension plans was $921.9 million and $1,032.0 million at December 31, 2018 and 2017, respectively.

Amounts recognized in the Consolidated Balance Sheets as of December 31, 2018 and 2017 were as follows:

	Pension Benefits		OPEB	
	2018	2017	2018	2017
Prepaid pension cost (included in other noncurrent assets)	$46.4	$39.9	$—	$—
Accrued benefit cost (included in accrued liabilities)	(2.7)	(2.7)	(0.4)	(0.6)
Pension liabilities	(97.9)	(102.7)	—	—
OPEB plan liabilities	—	—	(67.8)	(113.2)
Net liabilities recognized in the Consolidated Balance Sheets - Continuing Operations	$(54.2)	$(65.5)	$(68.2)	$(113.8)

The amounts included in accumulated other comprehensive loss in the Consolidated Balance Sheets, excluding tax effects, at December 31, 2018 and 2017 were as follows:

	Pension Benefits		OPEB	
	2018	2017	2018	2017
Accumulated other comprehensive (loss) income				
Net actuarial (loss) gain	$(294.5)	$(286.7)	$31.7	$33.6
Net prior service credit	(0.7)	—	56.1	30.4
Total	$(295.2)	$(286.7)	$87.8	$64.0

The pre-tax amounts recognized in other comprehensive loss in 2018 as components of net periodic benefit costs were as follows:

	Pension Benefits	OPEB
Amortization of:		
Net actuarial loss (gain)	$ 7.9	$(0.6)
Net prior service credit	—	(3.3)
Amounts arising during the period:		
Net actuarial loss	(17.7)	(1.8)
Net prior service credit	(0.7)	30.7
Settlements	1.9	—

Foreign currency gain (loss)	0.1	(2.0)
Other	—	0.8
Total	$ (8.5)	$ 23.8

Actuarial gains and losses in excess of 10.0% of the greater of the projected benefit obligation or the market-related value of plan assets were recognized as a component of net periodic benefit costs over the average remaining service period of a plan's active employees. As a result of the plan freezes, the actuarial gains and losses are recognized as a component of net periodic benefit costs over the average remaining life of a plan's active employees. Unrecognized prior service costs or credits are also recognized as a component of net periodic benefit cost over the average remaining service period of a plan's active employees. The amounts in accumulated other comprehensive loss that are expected to be recognized as components of net periodic benefit costs in 2019 are shown below:

	Pension Benefits	OPEB
Amortization of:		
Net actuarial loss (gain)	$ 6.0	$ (1.7)
Net prior service credit	0.1	(5.4)
Total	$ 6.1	$ (7.1)

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

The weighted average assumptions used to determine the benefit obligation at the measurement date were as follows:

	Pension Benefits		OPEB	
	2018	2017	2018	2017
Discount rate	4.0%	3.4 %	4.2%	3.5 %
Health care cost trend:				
Current				
Pre-Age 65	—	—	6.5%	6.3 %
Post-Age 65	—	—	6.5%	6.3 %
Ultimate	—	—	4.5%	4.5 %

The following table provides a summary of under-funded or unfunded pension benefit plans with projected benefit obligations in excess of plan assets as of December 31, 2018 and 2017:

	Pension Benefits	
	2018	2017
Projected benefit obligation	$722.8	$797.4
Fair value of plan assets	622.3	692.0

The following table provides a summary of pension plans with accumulated benefit obligations in excess of plan assets as of December 31, 2018 and 2017:

	Pension Benefits	
	2018	2017
Accumulated benefit obligation	$711.8	$784.6
Fair value of plan assets	622.3	692.0

We determine our assumption for the discount rate to be used for purposes of computing annual service and interest costs based on an index of high-quality corporate bond yields and matched-funding yield curve analysis as of the measurement date.

The Medicare Prescription Drug, Improvement and Modernization Act of 2003 included a prescription drug benefit under Medicare Part D, as well as a federal subsidy that began in 2006, to sponsors of retiree health care plans that provide a benefit that is at least actuarially equivalent, as defined in the Act, to Medicare Part D. Two of our retiree health care plans were at least actuarially equivalent to Medicare Part D and were eligible for the federal subsidy. During the years ended December 31, 2018 and 2017, Medicare Part D subsidies received by us were negligible.

During the year ended December 31, 2018, we received approximately $6.4 million in EGWP subsidies.

Benefit payments are expected to be paid as follows:

	Pension Benefits	OPEB-Gross	Estimated Subsidy Reimbursements
2019	$ 45.0	$ 25.5	1.5
2020	46.4	25.2	1.2
2021	48.1	24.8	1.2
2022	49.0	24.0	1.2
2023	50.3	23.6	1.2
2024-2028	264.6	110.9	5.8

Plan Assets

Our U.S. pension plans are frozen and we utilize a risk management approach for our U.S. pension plan assets. The overall investment objective of this approach is to further reduce the risk of significant decreases in the plan's funded status by allocating a larger portion of the plan's assets to investments expected to hedge the impact of interest rate risks on the plan's obligation. Over time, the target asset allocation percentage for the pension plan is expected to decrease for equity and other "return seeking" investments and increase for fixed income and other "hedging" investments. The assumed long-term rate of return for plan assets, which is determined annually, is likely to decrease as the asset allocation shifts over time. The expected long-term rate of return for plan assets is based upon many factors including asset allocations, historical asset returns, current and expected future market conditions, risk and active management premiums. The target asset allocation percentage as of December 31, 2018, for the primary U.S. pension plan was approximately 50% for return seeking investments and approximately 50% for hedging investments.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We segregated our plan assets by the following major categories and levels for determining their fair value as of December 31, 2018 and 2017. All plan assets that are valued using the net asset value per share ("NAV") practical expedient have not been included within the fair value hierarchy but are separately disclosed.

Cash and cash equivalents— Carrying value approximates fair value. As such, these assets were classified as Level 1. We also invest in certain short-term investments which are valued using the amortized cost method. As such, these assets were classified as Level 2.

Equity— The values of individual equity securities were based on quoted prices in active markets. As such, these assets are classified as Level 1. Additionally, this category includes underlying securities in trust owned life insurance policies which are invested in certain equity securities. These investments are not quoted on active markets; therefore, they are classified as Level 2. Additionally, we invest in certain equity funds that are valued at calculated NAV.

Fixed income— The values of certain fixed income securities were based on quoted prices in active markets. As such, these assets are classified as Level 1. The remaining fixed income securities are typically priced based on a valuation model rather than a last trade basis and are not exchange-traded. These valuation models involve utilizing dealer quotes, analyzing market information, estimating prepayment speeds and evaluating underlying collateral. Accordingly, we classified these fixed income securities as Level 2. We also invest in certain fixed income funds and securities in trust owned life insurance policies which are valued at NAV.

Real estate—The fair market value of real estate investment trusts is based on NAV.

For Level 2 and Level 3 plan assets, as applicable, we review significant investments on a quarterly basis including investigation of unusual fluctuations in price or returns and obtaining an understanding of the pricing methodology to assess the reliability of third-party pricing estimates.

The valuation methodologies described above may generate a fair value calculation that may not be indicative of net realizable value or future fair values. While we believe the valuation methodologies used are appropriate, the use of different methodologies or assumptions in calculating fair value could result in different amounts. We invest in various assets in which valuation is determined by NAV. We believe that the NAV is representative of fair value at the reporting date, as there are no significant restrictions on redemption of these investments or other reasons to indicate that the investment would be redeemed at an amount different than the NAV.

The fair values of our pension plan assets at December 31, 2018 and 2017, by asset category were as follows:

	December 31, 2018			December 31, 2017		
Asset Category	Total	Level 1	Level 2	Total	Level 1	Level 2
Cash and cash equivalents	$16.1	$11.9	$4.2	$14.3	$11.5	$2.8
Equity	0.1	—	0.1	125.0	124.9	0.1
Fixed income	219.4	—	219.4	246.7	0.7	246.0

Other	1.0	0.2	0.8	2.1	—	2.1
Subtotal	$236.6	$12.1	$224.5	$388.1	$137.1	$251.0
Plan assets measured at NAV						
Equity funds	$324.7			$279.7		
Fixed income	274.0			268.7		
Hedge funds and other	31.2			6.1		
Real estate	12.3			36.7		
Total plan assets measured at NAV	$642.2			$591.2		
Total	$878.8			$979.3		

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

The fair values of our OPEB plan assets at December 31, 2018 and 2017, by asset category were as follows:

	December 31, 2018			December 31, 2017	
Asset Category	Total	Level 1	Level 2	Total	Level 2
Cash and cash equivalents	$36.6	$—	$36.6	$30.7	$30.7
Other	0.2	0.2	—	—	—
Subtotal	$36.8	$0.2	$36.6	$30.7	$30.7
Investments measured at NAV					
Equity funds	$124.8			$166.3	
Fixed income funds	47.3			31.6	
Total investments measured at NAV	$172.1			$197.9	
Total	$208.9			$228.6	

Employee 401(k) Savings Plan — For the benefit of most of our U.S. employees, we maintain a defined contribution retirement savings plan that is intended to be qualified under Section 401(a) of the Internal Revenue Code. Under this plan, employees may contribute a percentage of eligible compensation on both a before-tax and after-tax basis. We may provide a 401(k) discretionary match to participants, but did not during the years ended December 31, 2018, 2017 or 2016.

MEPPs — MEPPs receive contributions from two or more unrelated employers pursuant to one or more collective bargaining agreements and the assets contributed by one employer may be used to fund the benefits of all employees covered within the plan. The risk and level of uncertainty related to participating in these MEPPs differs significantly from the risk associated with the Company-sponsored defined benefit plans. For example, investment decisions are made by parties unrelated to us and the financial stability of other employers participating in a plan may affect our obligations under the plan.

During each of the years ended December 31, 2018, 2017 and 2016, we recorded $3.0 million for MEPP withdrawal obligations. These charges were recorded as net restructuring, impairment and other charges and represent our best estimate of the expected settlement of these withdrawal liabilities. Total contributions to these plans for the years ended December 31, 2018 and 2017 were $6.6 million. See Note 5, Restructuring, Impairment and Other Charges, for further discussion on MEPP.

Note 11. Income Taxes

Income taxes have been based on the following components of earnings (loss) from continuing operations before income taxes for the years ended December 31, 2018, 2017 and 2016:

	2018	2017	2016
U.S.	$(56.4)	$(12.1)	$(617.9)
Foreign	84.7	87.6	120.7
Total	$28.3	$75.5	$(497.2)

The components of income tax expense (benefit) from continuing operations for the years ended December 31, 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Federal:			
Current	$15.8	$60.9	$(7.3)
Deferred	6.9	31.0	(51.7)
State:			
Current	(5.1)	0.2	(6.0)
Deferred	(7.4)	(6.0)	12.5
Foreign:			
Current	24.5	26.4	34.4
Deferred	3.2	(3.8)	5.8
Total	$37.9	$108.7	$(12.3)

The Tax Act was signed into law on December 22, 2017 and represents the most significant change to U.S. tax law since 1986. Key changes of the Tax Act are not limited to, but include the following: reduces the U.S. federal statutory rate from 35% to 21%; creates a territorial tax system rather than a worldwide system, generally allowing companies to repatriate future foreign-sourced earnings without incurring additional U.S. taxes; subjects certain foreign earnings on which U.S. income tax is currently deferred to a one-time transition tax; provides for new anti-deferral provisions to tax certain foreign earnings and a new base erosion tax; limits the deduction for net interest expense incurred by U.S. Companies; and eliminates or reduces certain other deductions.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Also on December 22, 2017, the SEC issued Staff Accounting Bulletin 118 (SAB 118) which provides guidance for companies analyzing their accounting for the income tax effects of the Tax Act. SAB 118 provides that a company may report provisional amounts based on reasonable estimates. The provisional estimates are then subject to adjustment during a measurement period up to one year and should be accounted for as a prospective change.

During 2017, we recorded provisional estimates of the impact of the Tax Act within our income tax expense. To determine the amount of the transition tax, we were required to quantify, among other factors, the amount of post-1986 earnings and profits of applicable foreign subsidiaries, the amount of non-U.S. tax paid on those earnings, as well as limitations of foreign tax credits. During 2018, we continued to analyze and interpret new guidance and clarifications of the Tax Act, and as a result recorded adjustments to the provisional estimates. During the fourth quarter of 2018, we finalized our accounting analysis for the income tax effects of the Tax Act. However, in the future, we may be subject to additional taxes as required under the Tax Act, based upon new regulations and guidance which may adversely affect our results of operations, financial position and cash flows.

The following table outlines the reconciliation of differences between the Federal statutory tax rate and our effective income tax rate:

	2018	2017	2016
Federal statutory tax rate	21.0 %	35.0 %	35.0 %
Change in valuation allowances	29.5	2.8	(7.1)
Interest limitation valuation allowance	84.6	—	—
State and local income taxes, net of U.S. federal income tax benefit	(14.4)	(2.9)	—
Impairment charges	—	6.6	(32.3)
Foreign tax	16.4	4.2	(1.2)
Adjustment of uncertain tax positions and interest	(19.2)	(3.2)	0.5
Reorganization	—	—	3.9
Foreign tax rate differential	(13.1)	(21.2)	3.0
Impact of the Tax Act	19.4	146.2	—
Tax impact of net gain on sale of Donnelley Financial and LSC shares	—	(21.6)	—
Tax impact on GILTI	15.3	—	—
Tax impact on sale of Print Logistics	(9.3)	—	—
Other	3.7	(1.9)	0.7
Effective income tax rate	133.9%	144.0%	2.5 %

Included in 2018 is the impact associated with limitations on our interest expense deduction as a result of the Tax Act. Non-deductible interest expense will be carried forward; however, it is more likely than not that the benefit of such deferred tax asset will not be fully realized and a valuation allowance of $23.9 million was recorded. The income tax expense also reflects final adjustments associated with the enactment of the Tax Act of $4.2 million to the one-time transition tax on foreign earnings, as well as $1.5 million to net deferred tax assets for the reduced corporate income tax rate. Additionally, the 2018 rate includes the inability to recognize a tax benefit on certain losses.

Included in 2017 is the impact associated with the enactment of the Tax Act which included a provisional estimate for the one-time transition tax on foreign earnings of $103.5 million, net of current year tax benefit on U.S. operations, as well as a provisional adjustment to net deferred tax assets for the reduced corporate income tax rate of $6.8 million. The income tax expense also reflects non-deductible goodwill impairment charges, the inability to recognize a tax benefit on certain losses and the impact of the non-taxable gain on the sale of the Donnelley Financial retained shares. The sale of the LSC retained shares generated a pre-tax capital loss of $51.6 million. The related tax capital loss will be carried forward; however, it is more likely than not that the benefit of such deferred tax asset will not be fully realized and a valuation allowance was recorded.

Included in 2016 is the impact of the non-deductible goodwill impairment charges and $9.5 million of a valuation allowance provision, net of federal tax benefits, on certain deferred taxes assets within state and local jurisdictions.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Deferred income taxes

The significant deferred tax assets and liabilities at December 31, 2018 and 2017 were as follows:

	2018	2017
Deferred tax assets:		
Pension and OPEB plan liabilities	$43.9	$58.8
Net operating losses and other tax carryforwards	280.0	255.1
Accrued liabilities	48.7	51.5
Foreign depreciation	36.4	19.4
Other	9.8	16.5
Total deferred tax assets	418.8	401.3
Valuation allowances	(255.9)	(238.3)
Net deferred tax assets	$162.9	$163.0
Deferred tax liabilities:		
Accelerated depreciation	$(64.3)	$(45.8)
Other intangible assets	(11.8)	(20.0)
Inventories	(5.8)	(7.3)
Other	(18.9)	(14.0)
Total deferred tax liabilities	(100.8)	(87.1)
Net deferred tax assets	$62.1	$75.9

Transactions affecting the valuation allowances on deferred tax assets during the years ended December 31, 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Balance, beginning of year	$238.3	$154.1	$130.8
Current year expense-net	29.1	84.5	35.2
Write-offs	(0.2)	(6.8)	(1.0)
Foreign exchange and other	(11.3)	6.5	(10.9)
Balance, end of year	255.9	238.3	$154.1

As of December 31, 2018, we had domestic and foreign net operating loss and other tax carryforwards of approximately $166.4 million and $113.6 million ($141.1 million and $114.0 million, respectively, at December 31, 2017), of which $124.8 million expires between 2019 and 2028. Limitations on the utilization of these tax assets may apply. We have provided valuation allowances to reduce the carrying value of certain deferred tax assets, as we have concluded that, based on the weight of available evidence, it is more likely than not that the deferred tax assets will not be fully realized.

Deferred income taxes are not provided on the excess of the investment value for financial reporting over the tax basis of investments in those foreign subsidiaries for which such excess is considered to be permanently reinvested in those operations. We have recognized deferred tax liabilities of $6.5 million and $4.7 million as of December 31, 2018 and December 31, 2017, respectively, related to local taxes on certain foreign earnings which are not considered to be permanently reinvested. Undistributed earnings of foreign subsidiaries that are considered indefinitely reinvested outside of the U.S. were approximately $826.3 million as of December 31, 2018. Upon repatriation of these earnings to the U.S. in the form of dividends or otherwise, we may be subject to the U.S. income taxes and foreign taxes. The tax cost would depend on income tax laws and circumstances at the time of the distribution. The Tax Act included a one-time mandatory tax on accumulated earnings of foreign subsidiaries and as such all previously unremitted earnings for which no U.S. income taxes had been accrued have now been subject to U.S. income taxes.

Cash payments for income taxes were $37.2 million, $46.1 million and $108.2 million during the years ended December 31, 2018, 2017 and 2016, respectively. Cash refunds for income taxes were $52.4 million, $43.3 million and $7.2 million during the years ended December 31, 2018, 2017 and 2016, respectively.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Our income taxes payable for federal and state purposes has been reduced by the tax benefits associated with the exercise of employee stock options and the vesting of restricted stock units. We adopted ASU No. 2016-09 "Compensation--Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting" on January 1, 2017. Under this guidance, when awards vest or are settled, the excess tax benefits and tax deficiencies are recorded as income tax expense or benefit in the income statement instead of within additional paid-in-capital. The impact to our consolidated financial statements for the years ended December 31, 2018 and 2017 was $1.7 million and $0.5 million, respectively. Prior to January 1, 2017, a component of the income tax benefit, calculated as the tax effect of the difference between the fair market value at the time stock options are exercised or restricted stock units vests and the grant date fair market value, directly increased or reduced RRD stockholders' equity. For the year ended December 31, 2016, the tax expense recognized as a reduction of RRD’s stockholders’ equity was $2.3 million.

See Note 15, Comprehensive Income, for details of the income tax expense or benefit allocated to each component of other comprehensive income.

Uncertain tax positions

Changes in unrecognized tax benefits at December 31, 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Balance at beginning of year	$30.9	$41.9	$51.0
Additions for tax positions of the current year	0.2	0.2	0.6
Reductions for tax positions of prior years	(2.8)	(9.0)	(1.5)
Settlements during the year	(0.1)	(0.1)	(1.8)
Lapses of applicable statutes of limitations	(3.2)	(2.1)	(6.4)
Balance at end of year	$25.0	$30.9	$41.9

As of December 31, 2018, 2017 and 2016, we had $25.0 million, $30.9 million and $41.9 million, respectively, of unrecognized tax benefits. Unrecognized tax benefits of $21.4 million as of December 31, 2018, if recognized, would have decreased income taxes and the corresponding effective income tax rate and increased net earnings. This potential impact on net earnings reflects the reduction of these unrecognized tax benefits, net of certain deferred tax assets and the federal tax benefit of state income tax items.

As of December 31, 2018, it is reasonably possible that the total amount of unrecognized tax benefits will decrease within twelve months by as much as $1.6 million due to the resolution of audits or expirations of statutes of limitations related to U.S. federal, state and international tax positions.

We classify interest expense and any related penalties related to income tax uncertainties as a component of income tax expense. The total interest (benefits) expense related to tax uncertainties recognized in the Consolidated Statements of Operations were $(1.1) million, $0.2 million and $(0.5) million for the years ended December 31, 2018, 2017 and 2016, respectively. There were no benefits from the reversal of accrued penalties for the years ended December 31, 2018, 2017 and 2016. Accrued interest of $2.9 million and $4.2 million related to income tax uncertainties were reported as a component of Other noncurrent liabilities in the Consolidated Balance Sheets at

December 31, 2018 and 2017, respectively. There were no accrued penalties related to income tax uncertainties for the years ended December 31, 2018 and 2017.

We have tax years from 2010 and thereafter that remain open and subject to examination by the IRS, certain state taxing authorities or certain foreign tax jurisdictions.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Note 12. Debt

Debt at December 31, 2018 and 2017 consisted of the following:

	2018	2017
Borrowings under the ABL Credit Agreement	$59.0	$216.0
11.25% senior notes due February 1, 2019 [(a)]	172.2	172.2
7.625% senior notes due June 15, 2020	65.8	238.4
7.875% senior notes due March 15, 2021	190.4	447.2
8.875% debentures due April 15, 2021	81.0	80.9
7.00% senior notes due February 15, 2022	140.0	140.0
6.50% senior notes due November 15, 2023	290.6	290.6
Term Loan Credit Agreement due January 15, 2024 [(b)]	544.7	—
6.00% senior notes due April 1, 2024	298.3	298.3
6.625% debentures due April 15, 2029	157.9	157.9
8.820% debentures due April 15, 2031	69.0	69.0
Other [(c)]	38.9	10.8
Unamortized debt issuance costs	(16.3)	(11.6)
Total debt	2,091.5	2,109.7
Less: current portion	(216.2)	(10.8)
Long-term debt	$1,875.3	$2,098.9

(a) As of December 31, 2018 and 2017, the interest rate on the 11.25% senior notes due February 1, 2019 was 13.25%, the maximum amount of these rates as a result of credit ratings downgrades.
(b) As of December 31, 2018, the interest rate on the Term Loan Credit Agreement due January 15, 2024 was 7.51%.
(c) Includes miscellaneous debt obligations and capital leases.

The fair values of the senior notes and debentures, which were determined using the market approach based upon interest rates available to us for borrowings with similar terms and maturities, were determined to be Level 2 under the fair value hierarchy. The fair value of our total debt was less than its book value by approximately $14.4 million at December 31, 2018 and greater than its book value by approximately $18.8 million at December 31, 2017.

On February 1, 2019, we retired the $172.2 million 11.25% senior notes using availability under our asset-based revolving credit facility (the “ABL Credit Agreement”).

On October 15, 2018, we entered into a $550.0 million senior secured Term Loan B credit facility pursuant to a credit agreement (the “Term Loan Credit Agreement”). Proceeds from the Term Loan Credit Agreement, net of a $5.5 million discount, were used to repurchase certain senior notes, pay transaction fees and repay a portion of borrowings under the ABL Credit Agreement.

Our obligations under the Term Loan Credit Agreement are guaranteed by the Guarantors and are secured by a security interest in substantially all assets of ours and the Guarantors, including certain material real property, subject to certain exceptions and exclusions. The ABL Priority Collateral secures our obligations and the obligations of the

Guarantors under the Term Loan Credit Agreement and related guarantees on a second-priority basis, and all other collateral other than the ABL Priority Collateral secures our obligations and the obligations of the Guarantors under the Term Loan Credit Agreement and related guarantees on a first-priority basis, in each case, subject to permitted liens.

The Term Loan Credit Agreement contains customary affirmative and negative covenants including negative covenants restricting, among other things, our ability to incur debt, make investments, make certain restricted payments (including payments on certain other debt and external dividends), incur liens securing other debt, consummate certain fundamental transactions, enter into transactions with affiliates and consummate asset sales. The Term Loan Credit Agreement requires that the net cash proceeds of significant asset sales be used to prepay borrowings under the Term Loan Credit Agreement, except in certain circumstances, including the reinvestment of net cash proceeds in assets useful to our business, repayment of borrowings under our ABL Credit Agreement or the funding of debt tenders, in each case, subject to certain restrictions and limitations set forth in the Term Loan Credit Agreement.

The Term Loan Credit Agreement is scheduled to mature on January 15, 2024, at which time all amounts outstanding under the Term Loan Credit Agreement will be due and payable. Principal payments of $1.4 million are due quarterly beginning at the end of the first quarter in 2019. Borrowings will bear interest at a Eurocurrency rate plus a margin of 5% or a base rate plus a margin of 4%.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

On October 15, 2018, we repurchased $172.6 million and $257.4 million in aggregate principal amount of the 7.625% senior notes due 2020 and 7.875% senior notes due 2021, respectively, pursuant to a tender offer. We recorded a loss on debt extinguishment of $32.3 million in the fourth quarter of 2018 on the repurchase of the bonds, representing tender premiums paid of $29.0 million, write-off of unamortized debt issuance costs of $1.5 million and fees and expenses of $1.8 million.

On September 29, 2017, we entered into the ABL Credit Agreement which amended and restated our prior $800.0 million senior secured revolving credit facility dated September 30, 2016. The ABL Credit Agreement provides for a senior secured asset-based revolving credit facility of up to $800.0 million. The amount available to be borrowed under the ABL Credit Agreement is equal to the lesser of (a) $800.0 million and (b) a borrowing base formula based on the amount of accounts receivable, inventory, machinery, equipment and, if we were to so elect in the future subject to the satisfaction of certain conditions, fee-owned real estate of ours and our material domestic subsidiaries that are guarantors under the ABL Credit Agreement (the “Guarantors”), subject to certain eligibility criteria and advance rates (collectively, the “Borrowing Base”). The aggregate amount of real estate, machinery and equipment that can be included in the Borrowing Base cannot exceed $200.0 million.

On October 15, 2018, we entered into Amendment No. 1 to the ABL Credit Agreement, which amended the ABL Credit Agreement to, among other things, permit (i) the incurrence of the debt pursuant to the Term Loan Credit Agreement and (ii) the incurrence of a lien on the ABL Priority Collateral to secure our obligations under the Term Loan Credit Agreement and related guarantees on a second-priority basis.

Our obligations under the ABL Credit Agreement are guaranteed by the Guarantors and are secured by a security interest in substantially all assets of ours and the Guarantors, including, only to the extent included in the Borrowing Base, real property, in each case subject to certain exceptions and exclusions. The assets of ours and the Guarantors consisting of accounts receivable, inventory, deposit accounts, securities accounts, machinery and equipment and, to the extent related to the foregoing, general intangibles, documents and instruments, as well as 65% of the equity interests of our first-tier foreign subsidiaries (collectively, the “ABL Priority Collateral”), secure our obligations and the obligations of the Guarantors under the ABL Credit Agreement and the related guarantees on a first-priority basis, and all other collateral other than the ABL Priority Collateral secures our obligations and the obligations of the Guarantors under the ABL Credit Agreement on a second-priority basis, in each case, subject to permitted liens.

The ABL Credit Agreement contains customary restrictive covenants, including a covenant which requires us to maintain a minimum fixed charge coverage ratio under certain circumstances. In addition, our ability to undertake certain actions, including, among other things, prepay certain junior debt, incur additional unsecured indebtedness and make certain restricted payments depends on satisfaction of certain conditions, including, among other things, meeting minimum borrowing availability thresholds under the ABL Credit Agreement. The ABL Credit Agreement generally allows annual dividend payments of up to $60.0 million in aggregate, though additional dividends may be allowed subject to certain conditions.

Borrowings under the ABL Credit Agreement bear interest at a rate dependent on the average quarterly availability under the ABL Credit Agreement and is calculated according to a base rate (except in certain circumstances, based on the prime rate) or a Eurocurrency rate (except in certain circumstances, based on London Inter-bank Offered Rate or “LIBOR”) plus an applicable margin. The applicable margin for base rate loans ranges from 0.25% to 0.50% and the

applicable margin for Eurocurrency loans ranges from 1.25% to 1.50%. In addition, a fee is payable quarterly on the unused portion of the amount available to be borrowed under the ABL Credit Agreement. The fee accrues at a rate of either 0.25% or 0.375% depending upon the average usage of the facility.

The ABL Credit Agreement is scheduled to mature on September 29, 2022, at which time all outstanding amounts under the ABL Credit Agreement will be due and payable. Borrowings under the ABL Credit Agreement may be used for working capital and general corporate purposes.

Based on our borrowing base as of December 31, 2018 and existing borrowings, including a debt maturity reserve for the $172.2 million 11.25% senior notes due February 1, 2019, we had approximately $524.0 million borrowing capacity available under the ABL Credit Agreement.

The weighted average interest rate on borrowings under our current and prior credit facilities was 3.5%, 3.5% and 2.5% for the years ended December 31, 2018, 2017 and 2016, respectively.

On June 7, 2017, we repurchased $41.7 million of the 6.625% debentures due April 15, 2029, $59.4 million of the 6.50% senior notes due November 15, 2023 and $101.7 million of the 6.00% senior notes due April 1, 2024 using borrowings under the prior credit agreement. The repurchases resulted in a net gain of $0.8 million which was recognized within loss on debt extinguishment in the Consolidated Statements of Operations for the year ended December 31, 2017 related to the difference between the fair value of the debt repurchased and the principal outstanding, partially offset by the premiums paid, unamortized debt issuance costs and other expenses.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

On May 22, 2017, certain third party financial institutions (such financial institutions collectively, the "Third Party Purchasers"), launched cash tender offers for certain of our outstanding debt securities, including our 7.625% senior notes due June 15, 2020 and 7.875% senior notes due March 15, 2021. On June 7, 2017, the Third Party Purchasers purchased $111.6 million in aggregate principal amount of the 7.625% senior notes due June 15, 2020 (the "Third Party Purchase Notes"). On June 21, 2017, we exchanged 6.1 million of our retained shares of Donnelley Financial for the Third Party Purchase Notes. We cancelled the Third Party Purchase Notes on June 21, 2017. As a result, we recognized a $14.4 million loss on debt extinguishment in the Consolidated Statements of Operations during the year ended December 31, 2017 related to premiums paid, unamortized debt issuance costs and other expenses. In addition, we recognized a net realized gain of $92.4 million resulting from the disposition of these retained shares of Donnelley Financial common stock within net investment and other income in the Consolidated Statements of Operations during the year ended December 31, 2017.

On August 4, 2017, we disposed of our remaining 0.1 million shares of Donnelley Financial common stock in exchange for $1.9 million in aggregate principal of our 7.875% senior notes due March 15, 2021 which were cancelled. As a result, we recognized a $0.3 million loss on debt extinguishments in the Consolidated Statements of Operations during the year ended December 31, 2017, related to premiums paid, unamortized debt issuance costs and other expenses. In addition, we recognized a net realized gain of $1.6 million resulting from the disposition of these retained shares of Donnelley Financial common stock within net investment and other income in the Consolidated Statements of Operations during the year ended December 31, 2017.

As of December 31, 2018, we had $179.8 million in other uncommitted credit facilities, primarily outside the U.S. (the "Other Facilities"). There were $111.2 million in outstanding letters of credit, bank guarantees and bank acceptance drafts which reduced availability, of which $34.2 million were issued under the ABL Credit Agreement. Total borrowings under the ABL Credit Agreement and the Other Facilities (the "Combined Facilities") were $97.3 million and $226.6 million as of December 31, 2018 and 2017, respectively.

At December 31, 2018, the future maturities of debt, including capitalized leases, were as follows:

	Amount
2019	$216.3
2020	71.4
2021	277.4
2022	204.5
2023	294.7
2024 and thereafter	1,049.4
Total [(a)]	$2,113.7

(a) Excludes unamortized debt issuance costs of $16.3 million and $5.9 million of bond discount which do not represent contractual commitments with a fixed amount or maturity date.

Spinoff Transactions

In connection with the spinoff transactions, we, Donnelley Financial and LSC executed various debt transactions in order to capitalize each company. As these debt transactions were executed in order to successfully complete the spinoff capitalization transactions, we have classified the corporate level debt repurchased, resulting losses on debt extinguishments and all related interest expense as discontinued operations or liabilities held for disposition.

On September 30, 2016, our then wholly-owned subsidiary Donnelley Financial issued senior notes and incurred a senior secured term loan B facility with total aggregate principal of $300.0 million and $350.0 million, respectively. Additionally on September 30, 2016, our then wholly-owned subsidiary LSC issued senior notes and incurred a senior secured term loan B facility with total aggregate principal of $450.0 million and $375.0 million, respectively. All of the related net proceeds were distributed to us or exchanged for debt in connection with the Separation. After the Separation, RRD has no obligations as it relates to these senior notes, senior secured term loan B facilities or any other LSC or Donnelley Financial indebtedness.

Additionally on September 30, 2016, we entered into an amended and restated credit agreement providing for $800.0 million in credit facilities, representing a reduction from the prior credit agreement which provided for $1.5 billion in credit facilities. As a result of the reduction in borrowing capacity, we recognized a $1.4 million loss related to unamortized debt issuance costs within loss from discontinued operations, net of tax, in the Consolidated Statements of Operations for the period ended December 31, 2016.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

On August 31, 2016, we and certain third party financial institutions (such financial institutions collectively, the "Third Party Purchasers"), launched cash tender offers for certain of our outstanding debt securities, including the Company's 6.125% senior notes due January 15, 2017 (the "2017 Notes"), 7.250% senior notes due May 15, 2018 the ("2018 Notes"), 8.250% senior notes due March 15, 2019 (the "2019 Notes") and 7.000% senior notes due February 15, 2022 (the "2022 Notes"). On September 16, 2016, the Third Party Purchasers purchased $274.4 million in aggregate principal amount of the 2017 Notes and 2018 Notes (the "Third Party Purchase Notes"). On September 30, 2016, we purchased approximately $503.6 million in aggregate principal amount of the 2017 Notes, the 2018 Notes, the 2019 Notes and the 2022 Notes (the "Company Purchase Notes"), and exchanged $300.0 million in aggregate principal amount of the Donnelley Financial senior notes for the Third Party Purchase Notes. We cancelled the Third Party Purchase Notes and Company Purchase Notes on September 30, 2016. As a result, we recognized an $85.3 million loss on debt extinguishments within loss from discontinued operations, net of tax, in the period ending December 31, 2016 related to premiums and other related transaction costs.

On October 6, 2016, we redeemed the outstanding $45.8 million principal amount of the 2018 Notes and the outstanding $21.3 principal amount of the 2019 Notes plus accrued and unpaid interest. Additionally, we redeemed the outstanding $155.2 million aggregate principal of the 2017 Notes on November 2, 2016. As a result, we recognized an additional $10.8 million loss on debt extinguishments within loss from discontinued operations in the fourth quarter of 2016.

Interest expense

The following table summarizes interest expense included in the Consolidated Statements of Operations:

	2018	2017	2016
Interest incurred	$173.8	$185.0	$206.1
Less: interest income	4.2	2.8	4.6
Less: interest capitalized as property, plant and equipment	1.3	2.6	2.8
Interest expense, net	$168.3	$179.6	$198.7

Interest paid, net of interest capitalized, was $171.7 million, $177.6 million and $280.1 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Note 13. Derivatives

All derivatives are recorded as other current or noncurrent assets or other current or noncurrent liabilities in the Consolidated Balance Sheets at their respective fair values. Unrealized gains and losses related to derivatives are recorded in the Consolidated Statements of Operations, or in other comprehensive income (loss), net of applicable income taxes, depending on the purpose for which the derivative is held. At the inception of a hedge transaction, we formally document the hedge relationship and the risk management objective for undertaking the hedge. In addition, we assess both at inception of the hedge and on an ongoing basis, whether the derivative in the hedging transaction has been highly effective in offsetting changes in fair value or cash flows of the hedged item and whether the derivative is expected to continue to be highly effective. The impact of any ineffectiveness is also recognized in the

Consolidated Statements of Operations.

We are exposed to the impact of foreign currency fluctuations in certain countries in which we operate. The exposure to foreign currency movements is limited in many countries because the operating revenues and expenses of our various subsidiaries and business units are substantially in the local currency of the country in which they operate. To the extent borrowings, sales, purchases, revenues, expenses or other transactions are not in the local currency of the subsidiary or operating unit, we are exposed to currency risk. Periodically, we use foreign exchange spot and forward contracts to hedge exposures resulting from foreign exchange fluctuations. Accordingly, the gains and losses associated with the fair values of foreign currency exchange contracts are recognized in the Consolidated Statements of Operations and are generally offset by gains and losses on underlying payables, receivables and net investments in foreign subsidiaries. We do not use derivative financial instruments for trading or speculative purposes. The aggregate notional value of the forward contracts at December 31, 2018 and 2017 was $170.8 million and $215.9 million, respectively. The fair values of foreign currency contracts were determined to be Level 2 under the fair value hierarchy and are valued using market exchange rates.

Our foreign currency contracts are subject to enforceable master netting agreements that allow us to settle positive and negative positions with the respective counterparties. We settle foreign currency contracts on a net basis when possible. Foreign currency contracts that can be settled on a net basis are presented net in the Consolidated Balance Sheets.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We manage credit risk for our derivative positions on a counterparty-by-counterparty basis, considering the net portfolio exposure with each counterparty, consistent with our risk management strategy for such transactions. Our agreements with each of our counterparties contain a provision where we could be declared in default on our derivative obligations if we either default or, in certain cases, are capable of being declared in default of any of our indebtedness greater than specified thresholds. These agreements also contain a provision where we could be declared in default subsequent to a merger or restructuring type event if the creditworthiness of the resulting entity is materially weakened.

As of December 31, 2018 and 2017, the fair value of our foreign currency contracts, which were the only derivatives not designated as hedges, along with the accounts in the Consolidated Balance Sheets in which the fair value amounts were included, were as follows:

	2018	2017
Derivatives not designated as hedges		
Prepaid expenses and other current assets	$0.9	$2.2
Accrued liabilities and other	0.3	—

The pre-tax losses (gains) related to derivatives not designated as hedges recognized in the Consolidated Statements of Operations for the years ended December 31, 2018, 2017 and 2016 were as follows:

	Classification of (Gain) Loss Recognized in the Consolidated Statements of Operations	2018	2017	2016
Derivatives not designated as hedges				
Foreign currency contracts	Selling, general and administrative expenses	$2.0	$(1.7)	$(5.7)

Note 14. Earnings per Share

Basic earnings per share is calculated by dividing net earnings attributable to RRD common stockholders by the weighted average number of common shares outstanding for the period. In computing diluted earnings per share, basic earnings per share is adjusted for the assumed issuance of all potentially dilutive share-based awards, including stock options, restricted stock units and performance share units. Performance share units are excluded if the performance targets upon which the issuance of the shares is contingent have not been achieved and the respective performance period has not been completed as of the end of the current period. Additionally, stock options are considered anti-dilutive when the exercise price exceeds the average market value of our stock price during the applicable period. In periods when we are in a net loss from continuing operations, share-based awards are excluded from the calculation of earnings per share as their inclusion would have an antidilutive effect.

During the years ended December 31, 2018, 2017 and 2016, no shares of common stock were purchased by us, however, shares were withheld for tax liabilities upon the vesting of equity awards.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

The reconciliation of the numerator and denominator of the basic and diluted earnings per share calculation and the anti-dilutive share-based awards for the years ended December 31, 2018, 2017 and 2016 were as follows:

	2018	2017	2016
Basic net loss per share attributable to RRD common stockholders:			
Continuing operations	$(0.16)	$(0.49)	$(6.95)
Discontinued operations	—	—	(0.14)
Net loss attributable to RRD stockholders	$(0.16)	$(0.49)	$(7.09)
Diluted net loss per share attributable to RRD common stockholders:			
Continuing operations	$(0.16)	$(0.49)	$(6.95)
Discontinued operations	—	—	(0.14)
Net loss attributable to RRD stockholders	$(0.16)	$(0.49)	$(7.09)
Numerator:			
Net loss attributable to RRD common stockholders - continuing operations	$(11.0)	$(34.4)	$(486.2)
Loss from discontinued operations, net of tax (Note 2)	—	—	(9.7)
Net loss attributable to RRD stockholders	$(11.0)	$(34.4)	$(495.9)
Denominator:			
Weighted average number of common shares outstanding	70.6	70.2	70.0
Dilutive options and awards	—	—	—
Diluted weighted average number of common shares outstanding	70.6	70.2	70.0
Weighted average number of anti-dilutive share-based awards:			
Stock options	0.8	1.0	0.9
Restricted stock units	0.8	0.8	0.3
Total	1.6	1.8	1.2
Dividends declared per common share	$0.34	$0.56	$2.48

Note 15. Other Comprehensive (Loss) Income

The components of other comprehensive (loss) income and income tax expense allocated to each component for the years ended December 31, 2018, 2017 and 2016 were as follows:

	2018		2017		2016	
	Before	Net of	Before	Net of	Before	Net of

	Tax Amount	Income Tax	Tax Amount	Tax Amount	Income Tax	Tax Amount	Tax Amount	Income Tax	Tax Amount
Translation adjustments	$(39.9)	$ —	$(39.9)	$57.1	$ —	$57.1	$(38.3)	$ —	$(38.3)
Adjustment for net periodic pension and OPEB plan cost	15.3	3.9	11.4	22.4	7.5	14.9	20.2	9.0	11.2
Adjustment for available-for-sale securities	—	—	—	(122.3)	(3.0)	(119.3)	122.3	3.0	119.3
Other comprehensive (loss) income	$(24.6)	$ 3.9	$(28.5)	$(42.8)	$ 4.5	$(47.3)	$104.2	$ 12.0	$92.2

During the year ended December 31, 2016, translation adjustments and income tax expense on pension and OPEB plan cost were adjusted to reflect previously recorded deferred taxes at their historical exchange rates.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

The following table summarizes changes in accumulated other comprehensive loss by component for the years ended December 31, 2018, 2017 and 2016:

	Changes in the Fair Value of Available-for-Sale Securities	Pension and OPEB Plan Cost	Translation Adjustments	Total
Balance at January 1, 2016	$ —	$(727.5)	$ (65.7)	$(793.2)
Other comprehensive income (loss) before reclassifications	119.3	(42.7)	(37.1)	39.5
Amounts reclassified from accumulated other comprehensive loss	—	52.7	—	52.7
Amounts reclassified due to disposition of an operating entity	—	1.2	(0.7)	0.5
Net change in accumulated other comprehensive income	119.3	11.2	(37.8)	92.7
Distribution to Donnelley Financial and LSC	—	556.8	88.0	644.8
Balance at December 31, 2016	$ 119.3	$(159.5)	$ (15.5)	$(55.7)
Other comprehensive (loss) income before reclassifications	(48.5)	10.6	53.6	15.7
Amounts reclassified from accumulated other comprehensive loss	(70.8)	4.3	2.8	(63.7)
Net change in accumulated other comprehensive loss	(119.3)	14.9	56.4	(48.0)
Balance at December 31, 2017	$ —	$(144.6)	$ 40.9	$(103.7)
Other comprehensive income (loss) before reclassifications	—	6.4	(39.5)	(33.1)
Amounts reclassified from accumulated other comprehensive loss	—	4.4	—	4.4
Impact of adopting ASU 2018-02	—	(22.0)	—	(22.0)
Other	—	0.6	—	0.6
Net change in accumulated other comprehensive loss	—	(10.6)	(39.5)	(50.1)
Balance at December 31, 2018	$ —	$(155.2)	$ 1.4	$(153.8)

As of July 1, 2018, we adopted ASU 2018-02, “Income Statement—Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income,” which resulted in a decrease to Accumulated deficit and increase to Accumulated other comprehensive loss of $22.0 million. See Note 18, New Accounting Pronouncements, for further discussion.

Reclassifications from accumulated other comprehensive loss for the year ended December 31, 2018, 2017 and 2016 were as follows:

2018	2017	2016	Classification in the Consolidated Statements of Operations

Translation Adjustments:				
Net realized loss	$—	$2.8	$—	(a)
Reclassifications, net of tax	$—	$2.8	$—	
Amortization of pension and OPEB plan cost:				
Net actuarial loss	$7.3	$7.2	$26.2	(b)
Net prior service credit	(3.3)	(2.8)	(12.7)	(b)
Curtailments and settlements	1.9	1.6	78.9	(b)
Reclassifications before tax	5.9	6.0	92.4	
Income tax expense	1.5	1.7	39.7	
Reclassifications, net of tax	$4.4	$4.3	$52.7	
Available-for-sale securities:				
Net realized gain on equity securities	$—	$(52.8)	$—	(c)
Reclassifications before tax	—	(52.8)	—	
Income tax expense	—	18.0	—	
Reclassifications, net of tax	$—	$(70.8)	$—	
Total reclassifications, net of tax	$4.4	$(63.7)	$52.7	

(a) Included within selling, general and administrative expenses in the Consolidated Statements of Operations.

(b) These accumulated other comprehensive (loss) income components are included in the calculation of net periodic pension and OPEB plan (income) expense recognized in cost of sales and net investment and other income in the Consolidated Statements of Operations (see Note 10, Retirement Plans).

(c) Included within net investment and other income in the Consolidated Statements of Operations.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Note 16. Stock and Incentive Programs for Employees and Directors

We recognize compensation expense based on estimated grant date fair values for all share-based awards issued to employees and directors, including stock options, restricted stock units and performance share units. We estimate the fair value of share-based awards based on assumptions as of the grant date. We recognize compensation expenses for those awards expected to vest, on a straight-line basis over the requisite service period of the award, which is generally the vesting term of three years for restricted stock awards and stock options and the performance period for performance share units. In 2018 and 2017, we recognized forfeitures as they occurred as a reduction of compensation expense as part of the adoption of ASU 2016-09. Prior to adoption, we estimated the number of awards expected to vest based, in part, on historical forfeiture rates and also based on our expectations of employee turnover within the specific employee groups receiving each type of award. Forfeitures were estimated at the time of grant and revised, if necessary, in subsequent periods, if actual forfeitures differed from those estimates.

Share-Based Compensation Expense

The total share-based compensation expense for continuing operations was $8.6 million, $8.4 million and $7.4 million for the years ended December 31, 2018, 2017 and 2016, respectively. The resulting income tax benefit was $2.2 million, $3.2 million and $2.9 million for the years ended December 31, 2018, 2017 and 2016, respectively. As of December 31, 2018, $11.1 million of unrecognized compensation expense related to share-based compensation plans is expected to be recognized over a weighted-average period of 1.7 years. In 2018 and 2017, we presented excess tax benefits as an operating activity on the Consolidated Statement of Cash Flows rather than as financing activity as part of the adoption of ASU 2016-09. Prior to adoption, excess tax benefits, shown as financing cash inflows in the Consolidated Statements of Cash Flows, were $2.6 million for the year ended December 31, 2016.

Share-Based Compensation Plans

We have one share-based compensation plan under which we may grant future awards, as described below, and one terminated or expired share-based compensation plan under which awards remain outstanding.

The 2017 Performance Incentive Plan (“2017 PIP”) was approved by stockholders to provide incentives to our key employees. Awards under the 2017 PIP are generally not restricted to any specific form or structure and could include, without limitation, stock options, stock units, restricted stock awards, cash or stock bonuses and stock appreciation rights. There were 3.2 million shares of common stock reserved and authorized for issuance under the 2017 PIP. At December 31, 2018, there were 1.2 million shares of common stock authorized and available for grant under the 2017 PIP.

General Terms of Awards

Under various incentive plans, we have granted certain employees non-qualified stock options, restricted stock units, performance share units and cash-settled stock units (“phantom stock units”). The Human Resources Committee of the Board of Directors has discretion to establish the terms and conditions for grants, including the number of shares, vesting and required service or other performance criteria. The maximum term of any award under the 2017 PIP and previous plans is ten years.

The exercise price of a stock option is equal to the closing price of our common stock on the option grant date and generally vest over four years. Options generally expire ten years from the date of grant or five years after the date of retirement, whichever is earlier.

The rights granted to the recipient of restricted stock unit awards generally accrue ratably over the restriction or vesting period, which is generally three years. We have also granted restricted stock unit awards which cliff vest three years from the grant date. Restricted stock unit awards are subject to forfeiture upon termination of employment prior to vesting, subject in some cases to early vesting upon specified events, including death or permanent disability of the grantee, termination of the grantee's employment under certain circumstances or a change in control of the Company. We record compensation expense of restricted stock unit awards based on the fair value of the awards at the date of grant ratably over the period during which the restrictions lapse. Dividends are not paid on restricted stock units.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

We also issue restricted stock units as share-based compensation for members of the Board of Directors. Director restricted stock units granted after January 2009 vest ratably over three years from the date of grant with the opportunity to defer any tranche of vesting restricted stock units until termination of service on the Board of Directors. Awards granted between January 2008 and January 2009 vested ratably over three years from the date of grant and were amended in May 2009 to provide the opportunity to defer any tranche of vesting restricted stock units until termination of service on the Board of Directors. For awards granted prior to January 2008, one-third of the restricted stock units vested on the third anniversary of the grant date, and the remaining two-thirds of the restricted stock units vested upon termination of the holder's service on the Board of Directors; the holder could also elect to defer delivery of the initial one-third of the restricted stock units until termination of service on the Board of Directors. In the event of termination of a holder's service on the Board of Directors prior to a vesting date, all restricted stock units of such holder will vest. All awards granted prior to December 31, 2007 are payable in shares of common stock or cash. In 2009, the option to have awards paid in cash was removed for awards granted in 2008 and future years. Awards that may be paid in cash are classified as liability awards due to their expected settlement in cash, and are included in Accrued liabilities and other in the Consolidated Balance Sheets. Compensation expense for these awards is measured based upon the fair value of the awards at the end of each reporting period. Awards payable only in shares are classified as equity awards due to their expected settlement in common stock. Compensation expense for these awards is measured based upon the fair value of the awards at the date of grant. Dividend equivalents are accrued for shares awarded to the Board of Directors and paid in the form of cash.

We have granted performance share unit awards to certain executive officers and senior management. Distributions under these awards are payable at the end of their respective performance periods in common stock or cash, at our discretion. The number of share units that vest can range from zero to 150% for the 2018, 2017 and 2015 awards, depending on achievement of a targeted performance metric for a performance period of three years inclusive of the year in which the award was granted. These awards are subject to forfeiture upon termination by us under certain circumstances prior to vesting. We expense the cost of the performance share unit awards based on the fair value of the awards at the date of grant and the estimated achievement of the performance metric, ratably over the performance period of three years.

In addition, we have granted phantom stock units to certain members of the Board of Directors and senior management. These awards vest and are payable in three equal installments over a period of three years after the grant date. Phantom stock units are not shares of our common stock and therefore the recipients of these awards do not receive ownership interest in the Company or stockholder voting rights. These awards are subject to forfeiture upon termination of employment prior to vesting, subject in some cases to early vesting upon specified events, including death or permanent disability of the grantee, termination of the grantee's employment under certain circumstances or a change in control of the Company. All phantom stock unit awards are classified as liability awards due to their expected settlement in cash, and are included in Accrued liabilities and other in the Consolidated Balance Sheets. Compensation expense for these awards is measured based upon the fair value of the awards at the end of each reporting period. Dividends are not paid on phantom stock units.

Stock Options

There were no options granted during the years ended December 31, 2018, 2017 and 2016.

Stock option awards as of December 31, 2018 and 2017, and changes during the year ended December 31, 2018 were as follows:

	Shares Under Option	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
	(thousands)		(years)	(millions)
Outstanding at December 31, 2017	1,257	$ 32.28	1.6	$ —
Cancelled/forfeited/expired	(518)	49.78		
Outstanding at December 31, 2018	739	19.99	1.4	—
Vested and exercisable at December 31, 2018	739	$ 19.99	1.4	$ —

There was no unrecognized compensation expense related to stock options as of December 31, 2018.

Cash proceeds received from the option exercises for the year ended December 31, 2016 was $1.1 million.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Restricted Stock Units

Nonvested restricted stock unit awards as of December 31, 2018 and 2017, and changes during the year ended December 31, 2018 were as follows:

	Shares (thousands)	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2017	1,082	$ 16.43
Granted	821	6.19
Vested	(554)	14.77
Forfeited	(38)	16.64
Nonvested at December 31, 2018	1,311	$ 10.71

As of December 31, 2018, there was $8.1 million of unrecognized share-based compensation which will be recognized over a weighted-average period of 1.5 years. The fair value of these awards was determined based on our stock price on the grant date reduced by the present value of expected dividends through the vesting period.

Performance Share Units

Nonvested performance share unit awards as of December 31, 2018 and 2017, and changes during the year ended December 31, 2018, were as follows:

	Shares (thousands)	Weighted Average Grant Date Fair Value
Nonvested at December 31, 2017	321	$ 16.34
Granted	683	6.10
Vested	(33)	16.73
Forfeited	(31)	16.30

Nonvested at December 31, 2018	940	$ 8.89

As of December 31, 2018, there was $3.0 million of unrecognized compensation expense related to performance share unit awards, which is expected to be recognized over a weighted-average period of 2.2 years.

Phantom Stock Units

Phantom stock unit awards as of December 31, 2018 and changes during the year ended December 31, 2018, were as follows:

	Shares (thousands)	Weighted Average Grant Date Fair Value
Granted	826	$ 8.73
Forfeited	(64)	8.73
Nonvested at December 31, 2018	762	$ 8.73

As of December 31, 2018, there was $2.2 million of unrecognized compensation expense related to phantom stock unit awards based on the price of our common stock on that date, which is expected to be recognized over a weighted-average period of 2.2 years.

Note 17. Segment and Geographic Area Information

During the first quarter of 2018, we realigned our reportable segments to reflect changes in our global operating structure and the manner in which the chief operating decision maker assesses information for decision-making purposes. All prior year amounts have been reclassified to conform to our current reporting structure.

Our segments and their product and service offerings are summarized below:

Business Services

Business Services provides customized solutions at scale to help clients inform, service and transact with their customers. The segment’s primary product and service offerings include commercial print, logistics, statement printing, labels, packaging, supply chain management, forms and business process outsourcing. This segment also includes all of our operations in Asia, Europe, Canada and Latin America.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Marketing Solutions

Marketing Solutions leverages an integrated portfolio of data analytics, creative services and multichannel execution to deliver comprehensive, end-to-end solutions. The segment's primary product and service offerings include direct marketing, in-store marketing, digital print, kitting, fulfillment, digital and creative solutions and list services.

Corporate

Corporate consists of unallocated selling, general and administrative activities and associated expenses including, in part, executive, legal, finance, communications, certain facility costs and last-in-first-out inventory provisions. In addition, certain costs and earnings of employee benefit plans, such as pension and OPEB expense (income) and share-based compensation, are included in Corporate and not allocated to the operating segments. Corporate also manages our cash pooling structures, which enables participating international locations to draw on our international cash resources to meet local liquidity needs.

Information by Segment

We have disclosed income (loss) from operations as the primary measure of segment earnings (loss). This is the measure of profitability used by our chief operating decision-maker and is most consistent with the presentation of profitability reported within the consolidated financial statements.

Year ended December 31, 2018	Total Sales	Intersegment Sales	Net Sales	Income (Loss) from Operations	Assets of Operations	Depreciation and Amortization	Capital Expenditures
Business Services	$5,720.4	$ (101.3)	$5,619.1	$ 242.3	$ 2,764.5	$ 128.4	$ 69.4
Marketing Solutions	1,218.6	(37.5)	1,181.1	54.6	674.6	47.4	11.6
Total operating segments	6,939.0	(138.8)	6,800.2	296.9	3,439.1	175.8	81.0
Corporate	—	—	—	(88.3)	201.7	5.6	23.4
Total operations	$6,939.0	$ (138.8)	$6,800.2	$ 208.6	$ 3,640.8	$ 181.4	$ 104.4

Year ended December 31, 2017							
Business Services	$5,890.4	$ (127.7)	$5,762.7	$ 248.6	$ 2,989.5	$ 139.9	$ 70.3
Marketing Solutions	1,215.7	(38.8)	1,176.9	30.8	717.0	47.4	14.6
Total operating segments	7,106.1	(166.5)	6,939.6	279.4	3,706.5	187.3	84.9
Corporate	—	—	—	(68.0)	198.0	4.1	23.6
Total operations	$7,106.1	$ (166.5)	$6,939.6	$ 211.4	$ 3,904.5	$ 191.4	$ 108.5

Year ended December 31, 2016							
Business Services	$5,810.0	$ (128.9)	$5,681.1	$ (73.8)	$ 2,874.4	$ 153.6	$ 63.2
Marketing Solutions	1,185.7	(33.8)	1,151.9	(99.4)	747.2	48.3	39.2
Total operating segments	6,995.7	(162.7)	6,833.0	(173.2)	3,621.6	201.9	102.4
Corporate	—	—	—	(151.7)	647.2	2.3	20.7
Total operations	$6,995.7	$ (162.7)	$6,833.0	$ (324.9)	$ 4,268.8	$ 204.2	$ 123.1

Corporate assets consisted of the following items at December 31, 2018, 2017 and 2016:

	2018	2017	2016
Cash and cash equivalents	$(31.8)	$(37.5)	$19.3
Deferred income tax assets, net of valuation allowances	37.1	36.7	67.5
Software, net	49.0	41.6	43.0
Deferred compensation plan and Company owned life insurance assets	89.3	88.6	75.3
Investment in LSC and Donnelley Financial	—	—	328.7
Property, plant and equipment, net	32.3	29.6	30.2
Other	25.8	39.0	83.2
Total Corporate assets	$201.7	$198.0	$647.2

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Net restructuring, impairment and other charges by segment for the years ended December 31, 2018, 2017 and 2016 are described in Note 5, Restructuring, Impairment and Other Charges.

Information by Geographic Area

The following table presents net sales by geographic region for the years ended December 31, 2018, 2017 and 2016. Net sales by geographic region are based upon the sales location.

	2018	2017	2016
U.S.	$4,990.4	$5,233.0	$5,250.3
Asia	968.5	857.3	703.5
Europe	485.9	455.0	482.8
Other	355.4	394.3	396.4
Consolidated net sales	$6,800.2	$6,939.6	$6,833.0

The following table presents long-lived assets by geographic region at December 31, 2018, 2017 and 2016. Long-lived assets include net property, plant and equipment, noncurrent deferred tax assets and other noncurrent assets.

	2018	2017	2016
U.S.	$621.9	$642.0	$720.1
Asia	113.8	127.6	102.6
Europe	75.5	81.0	65.3
Other	63.2	105.2	105.9
Consolidated long-lived assets	$874.4	$955.8	$993.9

Note 18. New Accounting Pronouncements

Recently Adopted Accounting Pronouncements

In February 2018, the Financial Accounting Standards Board (“FASB”) issued Accounting Standards Update (“ASU”) No. 2018-02 “Income Statement—Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income,” which permits the reclassification of tax effects stranded in accumulated other comprehensive income to retained earnings as a result of the Tax Act. The standard also requires entities to disclose whether or not they elected to reclassify the tax effects related to the Tax Act from accumulated other comprehensive income. The standard allows the option of applying either a retrospective adoption, meaning the standard is applied to all periods in which the effect of the Tax Act is recognized, or applying the amendments in the

period of adoption, meaning an adjustment is made to stockholders' equity as of the beginning of the reporting period. ASU 2018-02 will be effective in the first quarter of 2019; however, early adoption is permitted for interim and annual periods, including the reporting period in which the Tax Act was enacted. As of July 1, 2018, we adopted the provisions of ASU 2018-02, which resulted in a decrease to Accumulated deficit and increase to Accumulated other comprehensive loss of $22.0 million.

In January 2018, the FASB released guidance on the accounting for tax on the global intangible low-taxed income ("GILTI") provisions in the Tax Act. The GILTI provisions impose a tax on foreign income in excess of a deemed return on tangible assets of foreign corporations. The guidance indicates that either accounting for deferred taxes related to GILTI inclusions or treating any taxes on GILTI inclusions as period costs are both acceptable methods subject to an accounting policy election. During the fourth quarter of 2018, we elected to treat the tax effect of GILTI as a current-period expense when incurred.

In March 2017, the FASB issued ASU No. 2017-07 "Compensation—Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost," which changed the presentation of net periodic pension and postretirement benefit cost (net benefit cost) within the Statement of Operations. Under the previous guidance, net benefit cost was reported as an employee cost within income from operations. The amendment required the bifurcation of net benefit cost, with the service cost component presented with other employee compensation costs in income from operations while the other components are presented separately outside of income from operations. We retrospectively adopted this guidance as of January 1, 2018 and elected to use, as a practical expedient, the amounts disclosed in our notes for the prior comparative period as the estimation basis for applying the retrospective presentation requirements. See Note 10, Retirement Plans, for further discussion.

The impact of adoption was a $4.1 million increase in Total cost of sales, $11.0 million increase in Selling, general and administrative expenses and $15.1 million increase in Investment and other income-net for the year ended December 31, 2017 to the amounts previously reported. The impact of adoption for the year ended December 31, 2016 was a $28.1 million increase in Total cost of sales, $3.8 million decrease in Selling, general and administrative expenses and $24.3 million increase in Investment and other income-net to the amounts previously reported.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

In January 2017, the FASB issued ASU No. 2017-04 “Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment,” which eliminates Step 2 from the current goodwill impairment test, including determining the implied fair value of goodwill and comparing it with the carrying amount of that goodwill. The standard requires entities to record impairment charges based on the excess of a reporting unit’s carrying amount over its fair value. ASU 2017-04 will be effective in the first quarter of 2020; however early adoption is permitted for interim and annual goodwill impairment tests performed after January 1, 2017. We have elected to early adopt this guidance and have applied this guidance to all impairment analyses performed after January 1, 2017.

In November 2016, the FASB issued ASU No. 2016-18 “Statement of Cash Flows (Topic 230): Restricted Cash.” This update required that restricted cash and cash equivalents be included as components of total cash and cash equivalents as presented on the statement of cash flows. ASU No. 2016-18 was effective for fiscal years, and interim periods within those years, beginning after December 15, 2017 and a retrospective transition method is required. Early adoption was permitted, including adoption in an interim period. We elected to early adopt this guidance in the fourth quarter of 2017. Prior to adoption, we presented changes in restricted cash and cash equivalents in the investing section of our Consolidated Statement of Cash Flows. For the year ended December 31, 2016, the adoption resulted in a decrease of $4.3 million in net cash used in investing activities, a decrease of $1.5 million in net cash provided by financing activities and an increase of $0.7 million in the effect of exchange rates on cash, cash equivalents and restricted cash within the Consolidated Statement of Cash Flows. There was no impact to financial results.

In August 2016, the FASB issued ASU No. 2016-15 “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments.” This update addressed whether to present certain specific cash flow items as operating, investing or financing activities. The amendments in this update were effective for public entities for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2017 and are required to be retroactively adopted. Early adoption was permitted, including adoption in an interim period. We elected to early adopt this guidance in the fourth quarter of 2017. For the year ended December 31, 2016, the adoption resulted in an increase of $2.0 million in net cash provided by operating activities; a decrease of $5.6 million in net cash used in investing activities; and a decrease of $7.6 million in net cash provided by financing activities within the Consolidated Statement of Cash Flows. There was no impact to financial results.

In March 2016, the FASB issued ASU No. 2016-09 “Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting.” Under the new guidance, when awards vest or are settled, the excess tax benefits and tax deficiencies are recorded as income tax expense or benefit in the income statement instead of within additional paid-in capital. This guidance will be applied prospectively. Furthermore, the guidance required excess tax benefits to be presented as an operating activity on the statement of cash flows rather than as a financing activity, which can be applied retrospectively or prospectively. Under the new guidance, an election can be made regarding whether to account for forfeitures of share-based payments by recognizing forfeitures of awards as they occur or estimate the number of awards expected to be forfeited. This guidance was to be applied using a modified retrospective transition method, with a cumulative adjustment to retained earnings. We adopted this guidance as of January 1, 2017. The adoption had an immaterial impact on our consolidated financial statements.

In May 2014, the FASB issued ASU No. 2014-09 “Revenue from Contracts with Customers (Topic 606),” which outlined a single comprehensive model for entities to use in accounting for revenue using a five-step process that superseded virtually all existing revenue guidance. ASU 2014-09 also required additional quantitative and qualitative

disclosures. During 2016, the FASB issued ASU 2016-08 “Revenue from Contracts with Customers (Topic 606): Principal versus Agent Considerations (Reporting Revenue Gross versus Net),” ASU 2016-10 “Revenue from Contracts with Customers (Topic 606): Identifying Performance Obligations and Licensing,” and ASU 2016-12“Revenue from Contracts with Customers (Topic 606): Narrow-Scope Improvements and Practical Expedients,” which clarified the revenue recognition implementation guidance on principal versus agent considerations, identifying performance obligations, determining whether an entity's promise to grant a license provides a customer with either a right to use or a right to access the entity's intellectual property, assessing the collectability criteria, presentation of sales and similar taxes, noncash consideration and various other items. The standard allowed the option of either a full retrospective adoption, meaning the standard is applied to all periods presented, or a modified retrospective adoption, meaning the standard is applied only to the most current period. We adopted the guidance as of January 1, 2018 using the modified retrospective approach. See Note 4, Revenue Recognition, for further discussion.

In accordance with Topic 606, the impact of adoption as compared to the prior guidance on our Consolidated Statements of Operations was an increase of $18.1 million in Total net sales and an increase of $3.7 million in Total gross profit for the year ended December 31, 2018. Additionally, the impact of adoption as compared to the prior guidance was a decrease of $80.5 million in Inventories, decrease of $98.8 million in Accrued liabilities and other and an increase of $16.7 million in stockholders' equity at December 31, 2018. No other financial statement line item was materially impacted.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(In millions, except per share data and unless otherwise indicated)-(Continued)

Accounting Pronouncements Issued and Not Yet Adopted

In August 2018, the FASB issued ASU No. 2018-15 “Intangibles—Goodwill and Other—Internal-Use Software (Subtopic 350-40): Customer’s Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract” (“ASU 2018-15”). ASU 2018-15 aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software. ASU 2018-15 will be effective for us in 2020, however early adoption is permitted. We are currently evaluating the impact of ASU 2018-15 on the consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-14 “Compensation—Retirement Benefits—Defined Benefit Plans—General (Subtopic 715-20): Disclosure Framework—Changes to the Disclosure Requirements for Defined Benefit Plans” (“ASU 2018-14”), which removes certain disclosures that are no longer cost beneficial and also includes additional disclosures to improve the overall usefulness of the disclosure requirements to financial statement users. ASU 2018-14 will be effective for us in 2020, however early adoption is permitted. We are currently evaluating the impact of ASU 2018-14 on the consolidated financial statements.

In February 2016, the FASB issued ASU No. 2016-02 “Leases (Topic 842)” which requires lessees to record most leases on the balance sheet but recognize expense on the income statement in a manner similar to current accounting. Topic 842 is effective for annual reporting periods beginning after December 15, 2018, including interim periods within those reporting periods, with early adoption permitted. The new standard requires a lessee to recognize a right-of use (“ROU”) asset and lease liability on the balance sheet for all leases with a term longer than 12 months and requires additional disclosures. For lessors, Topic 842 also modifies the classification criteria and the accounting for sales-type and direct financing leases. Topic 842 was subsequently amended by ASU No. 2018-01 “Land Easement Practical Expedient for Transition to Topic 842”; ASU No. 2018-10 “Codification Improvements to Topic 842, Leases”; ASU No. 2018-11 “Leases (Topic 842): Targeted Improvements” (“ASU 2018-11”); and ASU No. 2018-20 “Narrow-Scope Improvements for Lessors”. ASU 2018-11 provides clarity on separating components of a lease contract and includes an option to not restate comparative periods in transition and elect to use the effective date of Topic 842 as the date of initial application. Based on this guidance, we will adopt Topic 842 in the first quarter of 2019 and use the transition option under ASU 2018-11. Consequently, financial information will not be recast and the disclosures required under the new standard will not be provided for periods prior to January 1, 2019. We also expect to elect several of the optional practical expedients provided in Topic 842.

In preparation of the adoption of Topic 842, we are implementing a new global lease accounting system and designing new business processes and controls over the financial reporting of leases.

Upon adoption of Topic 842, we expect to record a ROU asset and corresponding lease liability of approximately $200.0 million. We do not expect the adoption of Topic 842 will have a material impact on our results of operations or cash flows.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the stockholders and the Board of Directors of
R.R. Donnelley & Sons Company

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of R.R. Donnelley & Sons Company and subsidiaries (the "Company") as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive income, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the “financial statements”). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2018, based on criteria established in Internal Control — Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 27, 2019 expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

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

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

/s/ DELOITTE & TOUCHE LLP

Chicago, Illinois
February 27, 2019

We have served as the Company's auditor since 2002.

UNAUDITED INTERIM FINANCIAL INFORMATION

(In millions, except per-share data)

	Year Ended December 31,				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
2018					
Net sales	$1,707.8	$1,679.5	$1,649.5	$1,763.4	$6,800.2
Gross profit	294.7	290.6	315.4	354.7	1,255.4
Income from operations	32.2	25.5	60.9	90.0	208.6
Net (loss) earnings	(9.3)	(12.6)	34.8	(22.5)	(9.6)
Less: income attributable to noncontrolling interests	0.3	0.4	0.5	0.2	1.4
Net (loss) earnings attributable to RRD common stockholders	(9.6)	(13.0)	34.3	(22.7)	(11.0)
Basic net (loss) earnings per share attributable to RRD common stockholders:					
Net (loss) earnings attributable to RRD stockholders	(0.14)	(0.18)	0.49	(0.32)	(0.16)
Diluted net (loss) earnings per share attributable to RRD common stockholders:					
Net (loss) earnings attributable to RRD stockholders	(0.14)	(0.18)	0.49	(0.32)	(0.16)
2017					
Net sales	$1,658.9	$1,620.0	$1,734.9	$1,925.8	$6,939.6
Gross profit	326.8	302.0	323.5	363.9	1,316.2
Income from operations	43.3	34.4	31.8	101.9	211.4
Net (loss) earnings	(49.8)	76.7	(7.8)	(52.3)	(33.2)
Less: income attributable to noncontrolling interests	0.3	0.2	0.2	0.5	1.2
Net (loss) earnings attributable to RRD common stockholders	(50.1)	76.5	(8.0)	(52.8)	(34.4)
Basic net (loss) earnings per share attributable to RRD common stockholders:					
Net (loss) earnings attributable to RRD stockholders	(0.71)	1.09	(0.11)	(0.75)	(0.49)
Diluted net (loss) earnings per share attributable to RRD common stockholders:					
Net (loss) earnings attributable to RRD stockholders	(0.71)	1.09	(0.11)	(0.75)	(0.49)

Per share data is computed independently for each of the periods presented. As a result, the sum of the amounts for the quarter may not equal the total for the year.

The quarterly results above include the following significant items:

	Year ended December 31, 2018				
	First	Second	Third	Fourth	Full Year

	Quarter	Quarter	Quarter	Quarter	
Restructuring, impairment and other charges - net	$0.8	$ 11.0	$ 11.0	$ 16.0	$38.8
Acquisition-related expenses	—	—	—	0.1	0.1
Net gain on investments	—	—	—	(0.4)	(0.4)
Pension settlement charges	0.3	1.0	0.2	0.4	1.9
Loss on debt extinguishments	0.1	—	—	32.3	32.4
Gain on disposals of businesses	(0.1)	—	(4.5)	0.9	(3.7)
Total charges before taxes	$1.1	$ 12.0	$6.7	$ 49.3	$69.1
Total after-tax impact of the above charges, excluding the impact of noncontrolling interests	0.9	7.7	3.0	49.8	61.4
Tax expense related to the enactment of the Tax Act	2.3	—	(19.6)	23.0	5.7
Deferred income tax benefit	(0.7)	(1.1)	—	(4.6)	(6.4)
Total charges, net of taxes	$2.5	$ 6.6	$ (16.6)	$ 68.2	$60.7

	Year ended December 31, 2017				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
Restructuring, impairment and other charges - net	$9.1	$3.8	$ 33.8	6.3	$53.0
Spinoff-related transaction expenses	2.1	1.2	—	—	3.3
Net loss (gain) on investments	50.3	(92.4)	(1.6)	—	(43.7)
Pension settlement charges	—	—	—	1.6	1.6
Loss on debt extinguishments	—	13.6	6.5	—	20.1
Total charges before taxes	$61.5	$(73.8)	$ 38.7	$7.9	$34.3
Total after-tax impact of the above charges, excluding the impact of noncontrolling interests	60.1	(80.6)	29.1	2.6	11.2
Tax expense related to the enactment of the Tax Act	—	—	—	110.3	110.3
Deferred income tax benefit	—	—	—	(3.0)	(3.0)
Total charges, net of taxes	$60.1	$(80.6)	$ 29.1	$109.9	$118.5