INTERNATIONAL FLAVORS & FRAGRANCES INC
Form 10-K
February 26, 2019

UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
þ 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
o 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 1-4858
INTERNATIONAL FLAVORS & FRAGRANCES INC.
(Exact name of registrant as specified in its charter)

NEW YORK	13-1432060
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
521 WEST 57TH STREET, NEW YORK, N.Y.	10019
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (212) 765-5500
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 12 1/2¢ per share	New York Stock Exchange
6.00% Tangible Equity Units	New York Stock Exchange
0.500% Senior Notes due 2021	New York Stock Exchange
1.800% Senior Notes due 2026	New York Stock Exchange

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT:
None
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes þ No o
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 o No þ
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 þ No o
Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes þ No o
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendments to this Form 10-K. o

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
þ	o	o	o	o

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

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

The aggregate market value of the voting stock held by non-affiliates of the Registrant was $9,798,569,059 as of June 30, 2018.

As of February 15, 2019, there were 106,633,296 shares of the registrant’s common stock, par value 12 1/2¢ per share, outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant’s proxy statement for the 2019 Annual Meeting of Shareholders (the “IFF 2019 Proxy Statement”) are incorporated by reference in Part III of this Form 10-K.

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PART I

In this report, we use the terms "IFF," "the Company," "we," "us" and "our" to refer to International Flavors & Fragrances Inc. and its subsidiaries, and the term "Frutarom" to mean (i) for periods prior to October 4, 2018, Frutarom Industries Ltd and its subsidiaries and (ii) for periods after October 4, 2018, our business segment Frutarom. In addition, (1) when we refer to "our 2018 combined sales" in this report, we are combining the sales of Frutarom prior to its acquisition by us on October 4, 2018 with our sales (which include our historical business plus the sales of Frutarom from October 4, 2018 through December 31, 2018) and (2) when we refer to "Frutarom's 2018 combined sales" we are combining the sales of Frutarom prior to its acquisition by us on October 4, 2018 and the sales of Frutarom (as included in our Frutarom business segment) from October 4, 2018 through December 31, 2018. All other references to sales are to our reported sales included in our 2018 Consolidated Financial Statements.

ITEM 1. BUSINESS.

We are a leading innovator of sensory experiences that move the world. We co-create unique products that consumers taste, smell, or touch. Our expanded geographical footprint and product portfolio position us to better serve both our global customers and the growing regional, mid-sized and smaller specialty customers.

Through the acquisition, of Frutarom we increased our product portfolio with complementary adjacencies, such as natural colors, antioxidants for food preservation, nutraceuticals, ingredients for infant formula and proteins for elderly nutrition, and expanded core product lines with savory solutions aimed at the meat and fish industry, citrus and other naturals flavors, specialty ingredients and new cosmetic actives. As a result, we now have over 90,000 products within our portfolio that are provided to customers in approximately 195 countries, which includes a significant number of faster-growing small and mid-sized customers.

Prior to our acquisition of Frutarom, we had 37 manufacturing facilities and 21 creative centers and application laboratories, located in 35 different countries. Upon our acquisition of Frutarom, we acquired 60 additional manufacturing facilities and 84 additional R&D/application laboratories globally, including many of the countries in which we currently operate. We currently anticipate that, over time, we will optimize our global facilities footprint as we continue to seek opportunities to efficiently and cost-effectively deliver value to our global customers.

The 2018 combined sales of IFF and Frutarom, which combines the full year 2018 sales of both Frutarom and IFF, was approximately $5.1 billion which, management believes, makes us the second largest company in the taste, scent and nutrition industry. We expect that our combined cultures of innovation and partnership will allow us to further capitalize on this expansion to continue to offer our customers innovative and differentiated products.

During the past few years, through acquisitions and the development of Tastepoint, we have leveraged our expertise to expand our North American mid-sized customer base. With the acquisition of Frutarom, which was principally focused on serving small and mid-sized companies globally, we have significantly increased our exposure to these faster-growing customers. Based on our 2018 combined sales, approximately 35% of our customers are global consumer products companies while approximately 65% of our customers are small and mid-sized companies.

During 2018, our 25 largest customers accounted for 47% of our sales, however as a result of the effect of the Frutarom acquisition, our 25 largest customers only accounted for 37% of our 2018 combined sales. Similarly, while sales to our largest customer across all end-use categories (which principally arose from our Scent business) accounted for 9% to 12 % of our sales for each of the last three fiscal years, sales to this customer only accounted for 7% of our 2018 combined sales.

Our business is geographically diverse, with sales in the U.S representing approximately 25% of sales in 2018 and no other geographic market representing more than 6% of sales. We believe that more significant future growth potential for the flavors and fragrances industry, and for our business, exists in the emerging markets (which we classify as all markets except North America, Japan, Australia, and Western, Southern and Northern Europe). As a result, we intend to continue to build on our multi-decade experience in the emerging markets. During 2018, sales in emerging markets represented 48% of our 2018 sales. As our customers seek to grow their businesses in emerging markets, we provide them the ability to leverage our long-standing international presence and extensive market knowledge to help drive their brands in these markets.

We operate in three business segments, Taste (previously "Flavors"), Scent (previously "Fragrances") and, commencing upon its acquisition, Frutarom. In 2018, our Taste business represented 44% of our sales, our Scent business represented 47% of sales and Frutarom represented 9% of sales. Based on our 2018 combined sales, our Taste business represented 34% of sales, our Scent business represented 36% of sales and Frutarom represented 30% of sales.

For financial information about our reportable operating segments and the geographic areas in which we do business, please see Note 15 of our Consolidated Financial Statements included in this Form 10-K.

Vision 2020 Strategy

We believe that 2018 was a transformative year as our continued internal growth and our acquisition of Frutarom has delivered successes against all four pillars of our Vision 2020 strategy, which has focused on building differentiation and accelerating growth to create shareholder value:

(1) Innovating Firsts - We seek to strengthen our position by driving differentiation in priority R&D platforms across both businesses. During 2018, we continued to grow in our Re-Imagine modulation and PowderPure clean label portfolios, developed two new molecules which will be launched in 2019 and continued research into olfactory receptors and maximizing the nutritional value of our naturals. In addition, we opened a naturals laboratory in China, our first outside of the United States, to capitalize on the biodiversity of the region in the development of new products.

(2) Winning Where We Compete - Our goal is to achieve a #1 or #2 market leadership position in key markets and categories and with specific customers. In our Taste business, our Tastepoint initiative showed strong improvement, while our Scent business continued to achieve new wins.

(3) Becoming Our Customers' Partner of Choice - Our goal is to attain commercial excellence by providing our customers with in-depth, local consumer understanding, industry-leading innovation, outstanding service and the highest quality products. During 2018, we continued to reflect our customers’ focus on naturals and environmental sustainability as IFF-LMR Naturals increased the number of our organic certified sites and have received the Expertise Vegan Europe (EVE) Vegan certification for a portfolio of 90 of our natural extracts. Consumers, and therefore our customers, are continuing to focus on sensorial products that are responsibly sourced. Consequently, an integral component of this pillar is our ongoing commitment to sustainability and in 2018, our efforts in this area led us to be named one of Barron’s 100 Most Sustainable Companies.

(4) Strengthening and Expanding the Portfolio - We actively pursue value-creation through partnerships, collaborations, and acquisitions within Taste, Scent, Frutarom and adjacencies. We prioritize opportunities that provide (i) access to new technologies, (ii) the ability to increase our market share in key markets and with key customers or (iii) access to adjacent products or services that will position us to leverage our expertise in science and technology and our customer base. In addition to significantly expanding our customer base into the faster-growing midsize and smaller companies, the Frutarom acquisition allowed us to expand our cosmetic active ingredients business and enter into the attractive adjacent markets of savory solutions, natural colors, natural food protection and health and wellness products, including nutraceuticals and enzymes.

Our Product Offerings

Fragrances

Our fragrance business derives revenue from two sources, Fragrance Compounds and Ingredients. We are a global leader in the creation of fragrance compounds that are integral elements in the world’s finest perfumes and best-known consumer products, within fabric care, home care, personal wash, hair care and toiletries. Our Fragrance Ingredients business is a vertically integrated operation, originating with the development in our research laboratories of naturals, synthetic and proprietary molecules and innovative delivery systems, progressing to our manufacturing facilities that produce these ingredients in a consistent, high-quality and cost-effective manner and transitioning to our creative centers and application laboratories where our perfumers partner with our customers to create unique fragrance compounds for use in a variety of end-use products. We also produce cosmetic active and functional ingredients for use in cosmetics.

By providing our fragrance development teams with an extensive portfolio of innovative, high-quality and effective ingredients to support their creativity, we are able to provide our customers with a unique identity for their brands. These ingredients or fragrance compounds can then be combined with our innovative delivery systems, including our proprietary encapsulation technology, which consists of individual fragrance droplets coated with a protective polymeric shell to deliver superior fragrance performance throughout a product's lifecycle. These delivery systems are key differentiators in the growth of our consumer fragrance compounds.

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Fragrance Compounds. Fragrance Compounds are unique and proprietary combinations of multiple ingredients that are ultimately used by our customers in their consumer goods. Our creative and commercial teams within Fragrance Compounds are organized into two broad categories, Fine Fragrances and Consumer Fragrances.

Fine Fragrances. Fine Fragrances focuses on perfumes and colognes. IFF’s scientists and perfumers collaborate to develop new molecules, new natural extractions, and innovative processes that enliven perfumers' palettes and help them create unique, inspiring fragrances. We have created some of the industry-leading fine fragrance classics as well as cutting-edge niche fragrances, as evidenced by the number of top sellers.

Consumer Fragrances. Our Consumer Fragrances include five end-use categories of products:

i. Fabric Care - laundry detergents, fabric softeners and specialty laundry products;
ii. Home Care - household cleaners, dishwashing detergents and air fresheners;
iii. Personal Wash, including bar soap and shower gel;
iv. Hair Care; and
v. Toiletries.

Ingredients. Fragrance Ingredients consists of active and functional ingredients that are used internally and sold to third parties, including customers and competitors, for use in preparation of compounds. While the principal role of our Fragrance Ingredients facilities is to support our Fragrance Compounds business, we utilize our excess manufacturing capacity to manufacture and sell certain Fragrance Ingredients to third parties. We believe that this business allows us to leverage our fixed costs while maintaining the security of supply for our perfumers and ultimately our customers. Fragrance Ingredients available for sale to third parties include innovative ingredients that leverage our manufacturing experience as well as a limited amount of cost-competitive, commodity ingredients. As our Fragrance Compounds business grows, we expect that the percentage of capacity allocated to the production of Fragrance Ingredients for sale to third parties may decrease. Fragrance Ingredients also includes our cosmetic active and functional ingredients, which provide biologists and cosmetic chemists with innovative solutions to address cosmetic challenges such as skin aging and hair protection.

With approximately 1,300 separate fragrance and active and functional ingredients, plus additional botanicals and delivery systems, we believe we are a leader in the industry with the breadth of our product portfolio.

Consistent with our Vision 2020 strategy, our fragrance business continues to build upon our strengths to differentiate ourselves from our competitors, address evolving consumer demands and deliver accelerated growth. Specifically, we intend to focus on:

- Delivery Systems. We continue to invest in our delivery system technologies, including expansion of our market-leading encapsulation technology, which we believe will allow us to differentiate our products and those of our customers. Our encapsulation technology extends, controls the release of and increases aromas in a variety of consumer products. We have expanded our portfolio to offer multi-functional delivery systems with cosmetic actives that work to enhance skin penetration, protect the cosmetic active ingredients against interactions with other ingredients, provide long-lasting release, facilitate formulation of challenging ingredients and allow a better-targeted action.
- Consumer Demand for Natural and Organic Products. Increased demand for natural ingredients is a primary driver of future growth in Fine Fragrances. We believe that our in-house naturals operations, led by Laboratoire Monique Rémy (“LMR”) in Grasse, France, are industry leading in the processing of quality materials and offer decades of experience understanding natural products and perfecting the process of transforming naturals, such as narcissus, jasmine and blackcurrant bud, into pure absolutes that retain the unique fragrance of their origin. Our objective is to expand our naturals capabilities by offering our clients natural and proprietary ingredients.
- Transparency in Labeling. As consumers worldwide seek to require transparency in labeling, our customers will progressively seek to differentiate their products through the inclusion of a natural ingredients and proprietary molecules. We believe our focus on innovation, including innovative delivery systems and our natural and proprietary ingredients will help our customers address these changing consumer demand.

Flavors

Our flavors business is focused on building upon our strengths with flavors and focusing on addressing industry trends that will allow us to differentiate ourselves from our competitors and deliver accelerated growth consistent with our Vision

2020 strategy. The trends driving these growth opportunities include:

Continued Consumer Demand for Fresh, Clean and Authentic Products. Consumers are increasingly demanding that their food and beverage products contain natural and organic ingredients and possess dietary and nutritional value (reduced fat, salt, sugar, etc.). Based on these demands, natural food and beverage products are increasingly perceived by consumers as being of higher quality, healthier and more environmentally friendly. To ensure that they understand the quality of these products, consumers, non-governmental organizations and governmental agencies are seeking more transparency in product labeling. In response, many of our customers are announcing initiatives to provide “clean label” products (products that do not include any artificial ingredients). We believe our Vision 2020 strategy’s focus on innovation, including our modulation technology, delivery systems and our naturals and proprietary ingredients will help our customers address these changing consumer demands.

Expansion of Consumer Food Companies. The number of participants in the food industry continues to expand, with mid-sized regional companies and companies focused on niche-product categories joining the traditional global companies to drive and accelerate product innovation. Consequently, larger food and beverage companies are seeing slower growth than in previous years. To be responsive to these developments, we created Tastepoint by IFF, representing the collaboration of Ottens Flavors and David Michael, which primarily services mid-sized customers in North America by providing the approach of a smaller company, backed by expertise traditionally reserved for companies with a more global reach. Through our acquisition of Frutarom, we have added approximately 39,000 small and mid-sized customers. We intend to continue to look for innovative and value-creating methods for serving this growing customer base.

Flavors are the key building blocks that impart taste experiences in food and beverage products and, as such, play a significant role in determining consumer preference for the end products in which they are used. As a leading creator of Flavor Compounds, we help our customers deliver on the promise of delicious and healthy foods and drinks that appeal to consumers. While we are a global leader, our flavors business is more regional in nature, with different formulas that reflect local taste preferences. Consequently, we manage our flavors business geographically, creating Flavor Compounds in our regional creative centers which allow us to satisfy local taste preferences, while also helping to ensure regulatory compliance and production standards. We develop thousands of different flavors and taste offerings for our customers, most of which are tailor-made. We continually develop new formulas to meet changing consumer preferences and customer needs.

Our Flavor Compounds are ultimately used by our customers in the following four end-use categories of consumer goods:

i. Savory, for use in soups, sauces, condiments, prepared meals, meat, fish and poultry, potato chips and other savory snacks;
ii. Beverages, for use in juice drinks, carbonated beverages, flavored waters and spirits;
iii. Sweet, for use in bakery products, candy, chewing gum and cereal; and
iv. Dairy, for use in all dairy products such as yogurt, ice cream and cheese and other products that have a creamy flavor.

Our Frutarom business creates and manufactures a naturals-focused suite of Flavor Compounds and specialty fine ingredients, largely targeting small, local and regional customers. Our Frutarom business seeks to capitalize on the health and wellness focus of consumers and deliver growth by offering customers natural flavor products that combine solutions to create natural colors and natural functional food ingredients, which promote health benefits and extend shelf life. Based on this historical concentration, the majority of Frutarom's raw materials and products come from natural sources.

Frutarom’s products are focused on three principal areas:

(1) Savory Solutions - Savory Solutions are blends of flavors, natural colors, seasonings, functional ingredients and natural anti-oxidants that are primarily designed for the meat and fish industry. Savory Solutions are inherently very market specific reflecting the taste and historic focus of each region. Through acquisitions and product development, Frutarom has developed an extensive product portfolio that seeks to address these customer needs.

(2) Natural Product Solutions - Natural Product Solutions include the use of natural health ingredients, colors and shelf life extenders.

a.

Natural Health Ingredients - Natural functional food and supplement nutraceutical ingredients are derived from plants and herbs, which provide, or are perceived as providing, health benefits. In addition, these ingredients are used in dietary supplements, infant and elderly nutrition, cosmetics

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and personal care.

b. Natural Color - Wide array of natural colors and fruit and vegetable concentrates for food, beverage, and cosmetics.

c. Natural Food Protection - Natural antioxidants and anti-microbials used for natural food preservation and shelf life extension to beverages, cosmetic and healthcare products, and pet food and feed additives. These ingredients reduce the oxidative deterioration that leads to rancidity or loss of flavor, color, and nutritional value.

(3) Taste Solutions - Flavor compounds and foods.

(4) Specialty Fine Ingredients - specialty fine ingredients market include natural flavor extracts, specialty essential oils, citrus products, aromatic chemicals, and natural gums and resins. Fine ingredients are used for food, beverage, flavors and fragrances, and are often sold directly to food and beverage manufacturers who use them in producing consumer products. Flavor and fragrance manufacturers use fine ingredients products as a foundation in producing their flavor and fragrance substances.

Research and Product Development Process

Consumer Insights

We believe that the first step to creating an innovative and unique flavor or fragrance experience begins with gaining insight into the consumer. By developing a deep understanding of what consumers value and prefer, we are better able to focus our R&D and creative efforts.

Our consumer insight and marketing teams interpret trends, monitor product launches, analyze quantitative market data, and conduct numerous consumer interviews annually. Our sensory experts direct research programs exploring topics such as fragrance performance, the psychophysics of sensory perception (including chemesthetic properties such as warming, cooling, and tingling), the genetic basis for flavor and fragrance preference, and the effects of aromas on mood, performance, health, and well-being.

Based on this information, we develop innovative programs to evaluate potential products that enable us to understand the emotional connections between a prospective product and the consumer. We believe this ability to pinpoint the likelihood of a product's success translates into stronger brand equity, resulting in increased returns and greater market share gains for our customers as well as IFF.

Research and Development

We consider our R&D infrastructure to be one of our key competencies and we focus and invest substantial resources in the research and development of new and innovative molecules, compounds, formulas and technologies and the application of these to our customers' products. We spend approximately 8% of our sales on the research, development and implementation of new molecules, compounds and technologies that help our customers respond to changing consumer preferences. Using the knowledge gained from our Consumer Insights program, we strategically focus our resources around key R&D platforms that address consumer needs or preferences, or anticipate future preferences. By aligning our resources around these platforms, we ensure the proper support and focus for each program so that it can be further developed and eventually accepted for commercial application.

We currently have 392 patents in the United States, including those we have acquired from Frutarom and our other transactions. In addition, we have developed many unique molecules and delivery systems for our customers that are used as the foundations of successful flavors and fragrances around the world.

We have traditionally conducted our principal R&D activities in Union Beach, New Jersey, where we employ scientists and application engineers who collaborate with our other R&D centers around the world, to support the:

- discovery of new materials;
- development of new technologies, such as delivery systems;
- creation of new compounds; and
- enhancement of existing ingredients and compounds.

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As of December 31, 2018, we employed about 2,300 people globally in R&D activities, including 568 in our recently acquired Frutarom business. We spent $311.6 million, $295.5 million and $258.9 million, or approximately 7.8%, 8.7% and 8.3% of sales in 2018, 2017 and 2016, respectively, on R&D activities. While we have historically spent approximately 8% of sales on R&D activities, based on the significantly increased sales resulting from the Frutarom acquisition we expect that that percentage will decrease during 2019.

Our ingredients research program discovers molecules found in natural substances and creates new molecules that are subsequently tested for their sensorial value. To broaden our offerings of natural, innovative and unique products, we seek collaborations with research institutions and other companies throughout the world. We have established a number of such collaborations to strengthen our innovation pipeline. We may also consider acquiring companies that could provide access to new technologies, consistent with our Vision 2020 strategy.

The development of new and customized flavor and fragrance compounds is a complex process calling upon the combined knowledge of our scientists, flavorists and perfumers. Scientists from various disciplines work in project teams with flavorists and perfumers to develop flavor and fragrance compounds with consumer preferred performance characteristics. The development of new flavor and fragrance compounds requires (i) an in-depth knowledge of the flavor and fragrance characteristics of the various ingredients we use, (ii) an understanding of how the many ingredients in a consumer product interact and (iii) the creation of controlled release and delivery systems to enhance flavor and fragrance performance. To facilitate this process, we have a scientific advisory board that provides external perspectives and independent feedback on our R&D and sustainability initiatives.

In 2017, we launched Re-Imagine, a multi-tiered program to accelerate innovation and increase agility to capture unmet opportunities in the changing food and beverage market. Based on a combination of future trends analysis, consumer insights, and a modernized cross-category development process, the program guides our research and development efforts to ensure an innovation pipeline that addresses evolving consumer needs and desires.

Creative Application

We also have a network of 21 creative centers and application laboratories, including 84 acquired in the Frutarom transaction, around the world where we create or adapt the basic flavors or fragrances compounds that we have developed in the R&D process to commercialize for use in our customers' consumer products. Our global creative teams consist of perfumers, fragrance evaluators and flavorists, as well as marketing, consumer insights and technical application experts, from a wide range of cultures and nationalities. In close partnership with our customers' product development groups, our creative teams create the sensory experiences that our customers are seeking in order to satisfy consumer demands in each of their markets.

Development of new flavors and fragrances is driven by a variety of sources including requests from our customers, who are in need of a specific flavors and fragrances for use in a new or modified consumer product, or as a result of internal initiatives stemming from our Consumer Insights program. Our product development team works in partnership with our scientists and researchers to optimize the consumer appeal of the flavors and fragrances. A collaborative process between our researchers, our product development team and our customers then follows to perfect the flavors and fragrances so that it is ready to be included in the final consumer product.

In addition to creating new flavors and fragrances, our researchers and product development teams advise customers on ways to improve their existing products by adjusting or substituting current ingredients with more readily accessible or less expensive materials or by modifying the current ingredients to produce an enhanced yield. This often results in creating a better value proposition for our customers.

Our flavors and fragrances compound formulas are treated as trade secrets and remain our proprietary asset. Our business is not materially dependent upon any individual patent, trademark or license.

Supply Chain

We strive to provide our customers with consistent quality products on a timely and cost-effective basis by managing all aspects of the supply chain, from raw material sourcing through manufacturing, quality assurance, regulatory compliance and distribution.

Procurement

In connection with the manufacture of compounds, we use natural ingredients and, primarily in our fragrance compounds, synthetic ingredients. We purchase approximately 21,000 different raw materials from about 6,000 domestic and international suppliers and distributors.

The vast majority of Frutarom's raw materials and products come from natural sources. With the acquisition of Frutarom we significantly increased our natural products and therefore we expect that the percentage of our ingredients that are natural or crop-related has increased. Natural ingredients are derived from flowers, fruits and other botanical products as well as from animal products. They contain varying numbers of organic chemicals that are responsible for the fragrance or flavor of the natural product. Natural products are purchased in processed or semi-processed form. Some are used in compounds in the state in which they are purchased and others are used after further processing. Natural products, together with various chemicals, are also used as raw materials for the manufacture of synthetic ingredients by chemical processes. Our flavor products also include extracts and seasonings derived from various fruits, vegetables, nuts, herbs and spices as well as microbiologically-derived ingredients.

In order to ensure our supply of raw materials, achieve favorable pricing and provide timely transparency regarding inflationary trends to our customers, we continue to be focused on (i) implementing a forward-buy strategy, (ii) entering into supplier relationships to gain access to supplies that we do not have, (iii) implementing indexed pricing, (iv) reducing the complexity of our formulations and (v) evaluating whether it is more profitable to buy or make an ingredient. We are also concentrating on local country sourcing with our own procurement professionals.

Manufacturing and Distribution

Prior to our acquisition of Frutarom, we had 37 manufacturing facilities and 21 creative centers and application laboratories, located in 35 different countries. Our major manufacturing facilities have been located in the United States, the Netherlands, Spain, Great Britain, Indonesia, Turkey, Brazil, Mexico, China, India, and Singapore. Based on the regional nature of the Taste business and the concerns regarding the fragile nature of transporting raw materials, we have typically established smaller manufacturing facilities in our local markets that are focused on local needs. Products within the Scent business are typically composed of compounds that are more stable and more transportable around the world. Consequently, we have fewer manufacturing facilities within our Scent business, which produce compounds and ingredients for global distribution.

As part of our acquisition of Frutarom, we acquired their 60 manufacturing facilities. In addition, we acquired 84 additional creative centers and application laboratories globally, including many of the countries in which we currently operate. We currently anticipate that, over time, we will optimize our global facilities footprint to efficiently and cost-effectively deliver value to our global customers.

Our supply chain initiatives in developing markets are focused on increasing capacity and investments in key technologies. Within our more mature markets, we tend to focus on consolidation and cost optimization as well as implementing new technologies. In addition to our own manufacturing facilities, we develop relationships with third parties, including contract manufacturing organizations that permit us to expand access to the technologies, capabilities and capacity that we need to better serve our customers.

In 2018, we continued to invest in our facilities. We opened two new facilities in China, a flavors manufacturing facility in the Zhangjiagang Free Trade Zone and a Natural Product Research lab, located in the Nanjing Life Science Park and broke ground on a new Flavors and Fragrances plant in India.

Sustainability

Over the past several years, we have redefined the way we envision sustainability. Moving from the traditional “take-make-dispose” model, we have embraced the circular economy model - one that is restorative and regenerative by design, which we believe is key in safeguarding the wellbeing of our consumers, the health of our planet and the integrity of our business.

Our sustainability strategy is centered on three main platforms: Positive Principles, Regenerative Products and Sensational People and is a key enabler of our overall Vision 2020 business strategy.

- Positive Principles - We seek to embed the principles of eliminating the concept of waste, using clean renewable energy, and celebrating diversity into our company and culture.
- Regenerative Products - We strive to intentionally design our products to continuously support well-being and have a positive contribution to society and the environment in a circular economy.
- Sensational People - We seek to engage our employees and stakeholders to make a positive difference in the world.

In 2018, IFF was named to Barron’s 100 Most Sustainable Companies, the FTSE4Good Index Series and the Euronext Vigeo World 120. Additional achievements included:

- After surpassing three of our four 2020 environmental targets, we launched new environmental goals focused on science based emission reductions, zero waste to landfill and water stewardship - an initiative known collectively as “EcoEffective+”;
- Enhancing our tools and processes to incorporate the five aspects of circular design - material health, material recirculation, renewable energy, water and waste minimization, and responsible sourcing - in the very early stages of product development; and
- Obtaining FairWild certification for Peru Balsam - the first ever FairWild-certified flavor and fragrance ingredient that is commercially available globally. In addition, we have a robust slate of For Life-certified ingredients. The FairWild and For Life certification systems encompass fair working conditions, transparent administration, good community relations and environmental performance monitoring.

For more detailed information about our sustainability programs and performance, refer to our annual sustainability report.

Governmental Regulation

We develop, produce and market our products in a number of jurisdictions throughout the world and are subject to federal, regional and local legislation and regulations in each of the various countries. Our flavor and many of our fragrance products are intended for the food, beverage and pharmaceutical industries, which are subject to strict quality and regulatory standards. As a result, we are required to meet these strict standards which, in recent years, have become increasingly stringent.

Our products and operations are subject to regulation by governmental agencies in each of the markets in which we operate. These agencies include (1) the Food and Drug Administration and equivalent international agencies that regulate flavors and other ingredients in consumer products, (2) the Environmental Protection Agency and equivalent international agencies that regulate our manufacturing facilities, (3) the Occupational Safety and Health Administration and equivalent international agencies that regulate the working conditions in our manufacturing, research laboratories and creative centers, (4) local and international agencies that regulate trade and customs, (5) the Drug Enforcement Administration and other local or international agencies that regulate controlled chemicals that we use in our operations and (6) the Chemical Registration/Notification authorities that regulate chemicals that we use in, or transport to, the various countries in which we manufacture and/or market our products. We have seen an increase in registration and reporting requirements concerning the use of certain chemicals in a number of countries, such as Registration, Evaluation, Authorisation and Restriction of Chemicals ("REACH") regulations in the European Union.

In addition, we are subject to various rules relating to health, work safety and the environment at the local and international levels in the various countries in which we operate. Our manufacturing facilities throughout the world are subject to environmental standards relating to air emissions, sewage discharges, the use of hazardous materials, waste disposal practices and clean-up of existing environmental contamination. In recent years, there has been a significant increase in the stringency of environmental regulation and enforcement of environmental standards, and the costs of compliance have risen significantly, a trend we expect will continue in the future.

Competition

The markets for flavors, fragrances and specialty ingredients are part of a larger market that supplies a wide variety of ingredients and compounds used in consumer products. The broader market includes functional foods and food additives, including seasonings, texturizers, spices, enzymes, certain food-related commodities, and fortified products as well as nutritional ingredients and supplements and active cosmetic ingredients.

The global market for flavors and fragrances has expanded consistently, primarily as a result of an increase in demand for, and an increase in the variety of, consumer products containing flavors and fragrances.

The market for flavors and fragrances is highly competitive. Based on annual sales, our main competitors consist of (1) the three other large global flavor and fragrance manufacturers, Givaudan, Firmenich and Symrise, (2) mid-sized companies, (3) numerous local and regional manufacturers and (4) consumer product companies who may develop their own flavors or fragrances.

We believe that our ability to compete successfully in the flavors and fragrances sub-market is based on:

i. our in-depth understanding of consumers,

ii. innovation and technological advances from our perfumers, flavorists and research and development

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activities,

iii. ability to tailor products to customer's needs, efficiency, product quality and

iv. broad-based regulatory capabilities.

Large multi-national customers and, increasingly, mid-sized customers, may limit the number of their suppliers by placing some on “core lists,” giving them priority for development and production of their new or modified products. To compete more successfully in this environment, we must make continued investments in customer relationships and tailor our research and development efforts to anticipate customers’ needs, provide effective service and secure and maintain inclusion on certain “core lists.”

Private label manufacturers, mostly medium-sized, local or small food manufacturers, constitute a growing segment in the flavor market. Over the last decade, with the strengthening of supermarket chains and growing consumer price consciousness, demand and consumption of private label products has grown at a faster rate than the brand food industry rate. We believe that new business opportunities will continue to arise from these clients as they are increasing demanding products that are similar to existing products in the market, distinctive premium products, as well as more innovative products.

The global demand for functional foods, food additives, nutritional ingredients and supplements and active cosmetic ingredients is also increasing. With our recent acquisitions, we have expanded our offerings to include products with the functional food ingredient market, including ingredients focused on improving the health and wellness characteristics of a consumer good, the nutritional supplement market and the cosmetic actives markets. While the three other large global flavor and fragrance manufacturers, Givaudan, Firmenich and Symrise, are growing their business in these areas, we also compete with specialty chemical companies, other large multi-national companies and smaller regional and local participants that offer products that address these same needs.

Employee Relations

At December 31, 2018, we had approximately 13,000 employees worldwide, of whom approximately 2,100 are employed in the United States. We believe that relations with our employees are good.

Availability of Reports

We make available free of charge on or through the Investors link on our website, www.iff.com, all materials that we file electronically with the Securities and Exchange Commission (“SEC”), including our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports, filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, as soon as reasonably practicable after electronically filing such materials with, or furnishing them to, the SEC. During the period covered by this Form 10-K, we made all such materials available through our website as soon as reasonably practicable after filing such materials with the SEC.

The SEC maintains an Internet website, www.sec.gov that contains reports, proxy and information statements and other information that we file electronically with the SEC.

A copy of our Corporate Governance Guidelines, Code of Business Conduct and Ethics, and the charters of the Audit Committee, Compensation Committee and Nominating and Governance Committee of the Board of Directors are posted on the Investors section of our website, www.iff.com.

Our principal executive offices are located at 521 West 57th Street, New York, New York 10019 (212-765-5500).

Executive Officers of Registrant

The current executive officers of the Company, as of February 26, 2019, are listed below.

Name	Age	Position
Andreas Fibig	57	Chairman of the Board and Chief Executive Officer
Richard A. O'Leary	58	Executive Vice President and Chief Financial Officer
Nicolas Mirzayantz	56	Divisional Chief Executive Officer, Scent
Matthias Haeni	53	Divisional Chief Executive Officer, Taste
Gregory Yep	54	Executive Vice President, Chief Global Scientific & Sustainability Officer
Susana Suarez-Gonzalez	49	Executive Vice President, Chief Human Resources Officer
Anne Chwat	59	Executive Vice President, General Counsel and Corporate Secretary
Francisco Fortanet	50	Executive Vice President, Operations
Amos Anatot	65	President, Frutarom

Andreas Fibig has served as our Chairman since December 2014 and Chief Executive Officer since September 2014. Mr. Fibig has been a member of our Board of Directors since 2011. From 2008 to 2014, Mr. Fibig served as President and Chairman of the Board of Management of Bayer HealthCare Pharmaceuticals, the pharmaceutical division of Bayer AG. Prior to Bayer HealthCare Pharmaceuticals, Mr. Fibig held a number of positions of increasing responsibility at Pfizer Inc., a research-based pharmaceutical company, including as Senior Vice President in the US Pharmaceutical Operations group from 2007 through 2008 and as President, Latin America, Africa and Middle East from 2006 through 2007.

Richard A. O'Leary has served as our Executive Vice President and Chief Financial Officer since October 2016. Mr. O’Leary originally joined our Company in July 2007. Mr. O’Leary was our Senior Vice President, Controller and Chief Accounting Officer from July 2015 until his appointment as Chief Financial Officer, and served as our Vice President and Controller from May 2009 to November 2014. Mr. O’Leary served as our Interim Chief Financial Officer from November 2014 to July 2015 and from July 2008 to May 2009. Mr. O’Leary was also our Vice President, Corporate Development from July 2007 to May 2009. Prior to joining our Company, Mr. O’Leary held various positions at International Paper Co., a paper and packaging company, which he originally joined in 1986, including Chief Financial Officer of International Paper Company (Brazil) from June 2004 to June 2007. Prior to International Paper Co., Mr. O’Leary was with Arthur Young & Co.

Nicolas Mirzayantz has served as our Divisional Chief Executive Officer, Scent since October 2018. Mr. Mirzayantz originally joined our Company in 1988 and was our Group President, Fragrances from January 2007 to October 2018. Mr. Mirzayantz also served as a member of our Temporary Office of the Chief Executive Officer from October 1, 2009 until February 2010, our Senior Vice President, Fine Fragrance and Beauty Care and Regional Manager, North America from March 2005 to December 2006, our Senior Vice President, Fine Fragrance and Beauty Care from October 2004 to February 2005, and our Vice President Global Fragrance Business Development from February 2002 to September 2004.

Matthias Haeni has served as our Divisional Chief Executive Officer, Taste since October 2018. Mr. Haeni joined our Company in 2007 as Regional General Manager, Flavors Greater Asia and was our Group President, Flavors from April 2014 to October 2018. In 2010, Mr. Haeni transferred to Hilversum, The Netherlands where he served as Regional General Manager for Flavors in Europe, Africa, and the Middle East (“EAME”). Prior to joining our Company, Mr. Haeni was based in Singapore as Givaudan’s Vice President of Commercial Flavors, Southeast Asia Pacific and held similar positions throughout EAME.

Gregory Yep has served as our Executive Vice President, Chief Global Scientific & Sustainability Officer since June 2016. Prior to joining our Company, Dr. Yep was Senior Vice President of Research, Development & Applications with The Kerry Group from January 2015 to June 2016. Prior to The Kerry Group, Dr. Yep was Senior Vice President of R&D at PepsiCo from June 2009 to December 2015 and was Global Vice President, Application Technologies at Givaudan Flavors and Fragrances from December 2005 to June 2009. Earlier in his career, Dr. Yep was at McCormick & Company, where he held executive roles of increasing responsibility in food science. Dr. Yep holds a bachelor’s degree in biology and chemistry from the University of Pennsylvania and master’s degree and Ph.D. in organic chemistry from Johns Hopkins University.

Susana Suarez-Gonzalez has served as our Executive Vice President, Chief Human Resources Officer since November 2016. Prior to joining our Company, Ms. Gonzalez was Senior Vice President, Global Operations & Centers Expertise, Human Resources of Fluor Corporation from 2014 to 2016. Ms. Gonzalez began her career at Fluor

Corporation in 1991, and during her 25 years with the company, she held various leadership positions across several business groups and functions including construction, marketing, sales, project engineering and human resources.
Anne Chwat has served as our Executive Vice President, General Counsel and Corporate Secretary since August 2015 and as our Senior Vice President, General Counsel and Corporate Secretary from April 2011 to August 2015. Prior to joining

our Company, Ms. Chwat served as Executive Vice President and General Counsel of Burger King Holdings, Inc., a fast food hamburger restaurant company, from September 2004 to April 2011. From September 2000 to September 2004, Ms. Chwat held various positions at BMG Music (now Sony Music Entertainment), including Senior Vice President, General Counsel and Chief Ethics and Compliance Officer.

Francisco Fortanet has served as our Executive Vice President, Operations since August 2015 and as Senior Vice President, Operations from February 27, 2012 to August 2015. Mr. Fortanet joined our Company in 1995, and has served as our Vice President, Global Manufacturing Compounding from January 2007 to February 2012, our Vice President, Global Manufacturing from January 2006 to January 2007, our Regional Director of North America Operations from December 2003 to January 2005 and as our Plant Manager in Hazlet, New Jersey from October 1999 to May 2003.

Amos Anatot has served as our President, Frutarom since October 2018 when we acquired Frutarom. Mr. Anatot joined Frutarom in 2010, and most recently served as Frutarom's Executive Vice President of Global Supply Chain & Operations. Prior to joining Frutarom, Mr. Anatot spent 18 years at Teva Pharmaceutical Industries and its European subsidiaries and held various positions of increasing responsibility, including 10 years as Vice President of Teva Europe. Mr. Anatot holds an industrial engineering degree from Technion-Israel Institute of Technology.

ITEM 1A. RISK FACTORS.

We routinely encounter and address risks in conducting our business. Some of these risks may cause our future results to be different - sometimes materially different - than we presently anticipate. Below are material risks we have identified that could adversely affect our business. How we react to material future developments, as well as how our competitors and customers react to those developments, could also affect our future results

We may not realize the benefits anticipated from the Frutarom acquisition, which could adversely affect our business.

Part of our growth strategy has included growth through acquisitions within the fragrance, flavors, natural ingredient industries and adjacencies. The Frutarom acquisition was our most significant acquisition and brings a significantly different customer base and new adjacent product categories to our business. Our expectations about the benefits of this acquisition are based on projections and assumptions about our combined businesses which depend on (i) our ability to maintain the current Frutarom business, (ii) our ability to achieve the anticipated synergies and (iii) our ability to cross-sell the combined company's products. We may encounter significant challenges achieving these anticipated benefits, including the following:

- potential disruption of, or reduced growth in, our historical core businesses, due to diversion of management attention from our historical core business and uncertainty with our current customer and supplier relationships;
- challenges arising from the expansion of our product offerings into adjacencies with which we have limited experience, including functional foods and nutraceuticals;
- coordinating and integrating research and development teams across technologies and products to enhance product development while reducing costs;
- consolidating and integrating corporate, information technology, finance and administrative infrastructures, and integrating and harmonizing business systems, which may be more difficult than anticipated due to the significant number of acquisitions completed by Frutarom over the past few years;
- coordinating sales and marketing efforts to effectively position our capabilities and the direction of product development;
- difficulties in achieving anticipated cost savings, synergies, business opportunities, cross-selling opportunities and growth prospects from combining Frutarom's business with our business;
- the increased scale, regulatory compliance costs and complexity of our operations;
- retaining key employees, suppliers and other partners;
- retaining and efficiently managing Frutarom's significantly expanded and decentralized customer base;
- difficulties in anticipating and responding to actions that may be taken by competitors in response to the transaction; and
- the assumption of and exposure to unknown or contingent liabilities of Frutarom.

In addition, our anticipated benefits of the acquisition of Frutarom contemplate significant cost-saving synergies, which we expect to arise principally from facility consolidation and rationalization of supply chain relationships. Even if we are able to successfully integrate the operations of Frutarom with ours, we may not realize the full benefits of the acquisition if we are unable to identify and implement the anticipated cost savings or if the actions taken to implement such cost-savings have unintended consequences on our other business operations.

If we do not successfully manage these issues and the other challenges inherent in integrating Frutarom, we may not achieve the anticipated benefits of the acquisition, we could incur unanticipated expenses and charges and our operating results could be materially and adversely affected.

The Frutarom acquisition resulted, and may continue to result, in significant charges or other liabilities that could adversely affect the financial results of the combined company.

Our financial results, following the acquisition of Frutarom, were adversely affected by cash expenses and non-cash accounting charges incurred in connection with the acquisition. We expect these types of charges to continue as a result of the integration of the business and operations of Frutarom. As a result of the acquisition, we assumed all of Frutarom's liabilities, including unknown and contingent liabilities. Due to the nature of the transaction and the characteristics of Frutarom, our ability to conduct extensive due diligence was limited and we may subsequently identify additional obligations, including those that Frutarom assumed in its prior acquisitions, during the measurement period. Prior to our acquisition, Frutarom completed 47 acquisitions since 2011, including 22 since the beginning of 2016. Our ability to accurately identify and assess the magnitude of the liabilities assumed by Frutarom in these acquisitions was limited by, among other things, the information available to us and Frutarom and the limited operating experience that Frutarom has with these acquired entities. If we are not able to completely assess the scope of these liabilities or if these liabilities are neither probable nor estimable at this time, our future financial results could be adversely affected by unanticipated reserves or charges, unexpected litigation or regulatory exposure, unfavorable accounting charges, unexpected increases in taxes due, a loss of anticipated tax benefits or other adverse effects on our business, operating results or financial condition.

Our incurrence of additional debt to pay the cash portion of the Frutarom consideration increased our financial leverage and could adversely affect our future cash flows and cost of capital.

In connection with the acquisition of Frutarom, we borrowed approximately $3.3 billion of additional debt, consisting of $2.8 billion of senior unsecured notes, $350.0 million in term loans and $139.5 million of senior unsecured amortizing notes associated with the tangible equity units. Incurring this new debt significantly increased our leverage. There may be circumstances in which required payments of principal and/or interest on this new debt could adversely affect our cash flows, our operating results or our ability to return capital to our shareholders through dividends or stock repurchases. Furthermore, our degree of leverage could adversely affect our future credit ratings. If we are unable to maintain or improve our current investment grade rating, it could adversely affect our future cost of funding, liquidity and access to capital markets. In addition, our current level of leverage could increase our vulnerability to sustained, adverse macroeconomic weakness, limit our ability to obtain further financing, and our ability to pursue certain operational and strategic opportunities, including large acquisitions.

If we are unable to successfully market to our expanded and decentralized Taste and Frutarom customer base, our operating results and future growth may be adversely affected.

As a result of our acquisition of Frutarom, the number of our customers significantly increased and became more decentralized. Our historical customer base was primarily comprised of large food, beverage and consumer products companies. These customers have faced, in recent years, growing competition from mid- and small-sized regional companies and companies focused on niche-product categories. In connection with Vision 2020, we identified serving these small and mid-sized clients as a key element of our business strategy and invested in this strategy through the introduction of Tastepoint by IFF in the US, which resulted from the acquisitions of Ottens Flavors and David Michael. With the Frutarom acquisition, we have significantly expanded our customer base, by approximately 39,000 customers, composed principally of globally-located small and mid-sized companies. This substantial increase in our customer base will require us to adjust our corporate, information technology, finance and administrative infrastructures and corporate sales and customer culture. Further, we may experience difficulty managing the growth of a portfolio of customers that is diverse both with respect to the types of services they will require and the infrastructure required to deliver our products. However, if we are unable to successfully implement this strategy or gain market share with this growing customer base, our future growth could be adversely affected.

Our business is highly competitive, and if we are unable to compete effectively our sales and results of operations will suffer.

The market for flavors, fragrances and natural ingredients is highly competitive. We face vigorous competition from companies throughout the world, including multi-national and specialized flavor, fragrance and cosmetic ingredients companies, as well as consumer product companies who may develop their own flavors, fragrances or cosmetic ingredients. In the flavors industry, we also face increasing competition from ingredient suppliers that have expanded their portfolios to include flavor offerings. Some of our competitors specialize in one or more of our product sub-segments, while others participate in many of our product sub-segments. In addition, some of our global competitors may have greater resources than we do or may have proprietary products that could permit them to respond to changing business and economic conditions more effectively than we can. Consolidation of our competitors may exacerbate these risks.

As we continue to enter into adjacent markets, such as cosmetic ingredients and, recently through the Frutarom acquisition, functional foods, specialty fine ingredients and health and wellness products, we may face greater competition-related risks in these markets than with our core historic flavor and fragrances businesses. For example, the specialty fine ingredients market is more price sensitive than the flavors market and is characterized by relatively lower profit margins. Some fine ingredients products manufactured by Frutarom are less unique and more replaceable by competitors' products. There is no assurance that operating margins will not erode in the future, which could substantially impact our business, operating results and financial condition.

Competition in our business is based on innovation, product quality, regulatory compliance, pricing, quality of customer service, the support provided by marketing and application groups, and understanding of consumers. It is difficult for us to predict the timing, scale and success of our competitors' actions in these areas. In particular, the discovery and development of new flavors and fragrance compounds and ingredients, protection of our intellectual property and development and retention of key employees are critical to our ability to effectively compete in our business. Increased competition by existing or future competitors, including aggressive price competition, could result in the potential loss of substantial sales or create the need for us to reduce prices or increase spending, and this could have an adverse impact on sales and profitability.

If we are unable to provide our customers with innovative, cost-effective products that allow them to achieve their own profitability expectations, our sales and results of operations will suffer.

During 2018, our 25 largest customers accounted for 47% of our sales, and the largest customer across all end-use categories accounted for 9% to 12 % of our sales for each of the last three fiscal years. Loss of or a reduction in sales to our largest customer or any of our other large customers for an extended period of time could adversely affect our business or financial results.

Large multi-national customers, and increasingly, middle-market customers are unilaterally limiting the number of their suppliers or rationalizing the number of products that they offer to increase their margins and profitability. As part of these initiatives, these customers are creating "core lists" of suppliers and giving these "core lists" suppliers priority for new or modified products. Recently, these customers are making inclusion on their "core lists" contingent upon a supplier providing more favorable commercial terms, including rebates, which could adversely affect our margins. We must either offer competitive cost-in-use solutions to secure and maintain inclusion on these "core lists" or seek to manage the relationship without being on the "core-list". If we chose not to pursue "core-list" status due to profitability concerns or if we are unable to obtain "core-list" status our ability to maintain our share of the customers' future purchases could be adversely affected and therefore our future results of operations.

Furthermore, consolidations amongst our customers have resulted in larger and more sophisticated customers with greater buying power and additional negotiating strength. These and other profitability initiatives being pursued by our customers reduce the market opportunity for which we compete and subject the volume and pricing of the remaining suppliers to downward pressure. To be successful in this competitive environment, we must continue to make investments in customer relationships and tailor product research and development in order to anticipate customers' needs, deliver products that contribute to our customers' profitability, and provide effective customer service.

We may not successfully develop and introduce new products that meet our customers' needs, which may adversely affect our results of operations.

Our ability to differentiate ourselves and deliver growth in line with our Vision 2020 strategy largely depends on our ability to successfully develop and introduce new products and product improvements that meet our customers' needs, and ultimately appeal to consumers. Innovation is a key element of our ability to develop and introduce new products. We cannot be certain that we will be successful in achieving our innovation goals, such as the development of new molecules, new and expanded delivery systems and other technologies. We currently spend approximately 8% of our sales on research and development; however, such investments may only generate future revenues to the extent that we are able to develop products that meet our customers' specifications, are at an acceptable cost and achieve acceptance by the targeted consumer market. Furthermore, there may be significant lag times from the time we incur R&D costs to the time that these R&D costs may result in increased revenue. Consequently, even when we "win" a project, our ability to generate revenues as a result of these investments is subject to numerous customer, economic and other risks that are outside of our control, including delays by our customers in the launch of a new product, the level of promotional support for the launch, poor performance of our third-party vendors, anticipated sales by our customers not being realized or changes in market preferences or demands, or disruptive innovations by competitors.

A disruption in our manufacturing operations or our supply chain could adversely affect our business and financial results.

As a company engaged in the global development, manufacture and distribution of products, we are subject to the risks inherent in such activities, including industrial accidents, environmental events, strikes and other labor disputes, product quality control issues, safety, licensing requirements and other regulatory issues, as well as natural disasters, international conflicts, terrorist acts and other external factors over which we have no control. While we operate research and development, manufacturing and distribution facilities throughout the world, many of these facilities are extremely specialized and certain of our R&D or creative laboratories facilities are uniquely situated to support our research and development efforts while certain of our manufacturing facilities are the sole location where a specific ingredient or product is produced. If our research and development activities or the manufacturing of ingredients or products were disrupted, the cost of relocating or replacing these activities or reformulating these ingredients or products may be substantial, which could result in production or development delays or otherwise have an adverse effect on our margins, operating results and future growth.

A disruption in our supply chain, including the inability to obtain ingredients and raw materials from third parties, could adversely affect our business and financial results.

In connection with our manufacture of our fragrance and flavor compounds, we often rely on third party suppliers for ingredients and raw materials that are integral to our manufacture of such compounds. Our purchases of raw materials are subject to fluctuations in market price and availability caused by weather, climate change, growing and harvesting conditions, market conditions, governmental actions and other factors beyond our control. Our natural products and ingredients may also be subject to import alerts or specific country regulations that would impair our ability to obtain sufficient quantity at the relevant manufacturing facility. In addition, our ingredient suppliers, similar to us, are subject to the risks inherent in manufacturing and distribution on a global scale, including industrial accidents, environmental events, strikes and other labor disputes, disruptions in supply chain or information systems, disruption or loss of key research or manufacturing sites, product quality control, safety and environmental compliance issues, licensing requirements and other regulatory issues, as well as natural disasters, international conflicts, terrorist acts and other external factors over which they have no control. These suppliers also could become insolvent or experience other financial distress. For example, a fire at the manufacturing facility of BASF Group ("BASF"), one of our suppliers, in 2017 caused them to declare a force majeure and has resulted in a disruption of the availability of certain ingredients used in some of our fragrance and flavor compounds. If our suppliers are unable to supply us with sufficient ingredients and raw materials to meet our needs, we would need to seek alternative sources of such materials or pursue our own production of such ingredients or direct acquisition of such raw materials. However, for certain of our raw ingredients and raw materials we rely on a limited number of suppliers where there are not readily available alternatives. If we are unable to obtain or manufacture alternative sources of such ingredients or raw materials at a similar cost, we would seek to (i) reformulate our compounds and/or (ii) increase pricing to reflect the higher supply cost. However, if we are not able to successfully implement any of these alternatives, we could experience disruptions in production, increased cost of sales and a corresponding decrease in gross margin or reduced sales if our competitors were able to more successfully adjust to such market disruption. Such fluctuations and decrease in gross margin could have a material adverse effect on our business, results of operations and financial condition.

Volatility and increases in the price of raw materials, energy and transportation could harm our profits.

We use many different raw materials for our business, including essential oils, extracts and concentrates derived from fruits, vegetables, flowers, woods and other botanicals, animal products, raw fruits, organic chemicals and petroleum-based chemicals. Historically, we have experienced a considerable amount of price volatility in natural products that represent approximately half of our raw material purchases, and we expect this volatility to continue in the near future. For example, during and in 2018, we experienced increases in the prices of certain naturals, including citrus. In addition, because Frutarom's number of natural product offerings is substantial, this risk may be exacerbated. Availability and pricing of these natural products can be impacted by crop size and quality, weather, climate change, alternative land use, and other factors which we cannot control.

If we are unable to increase the prices to our customers of our flavor or fragrance compounds or natural ingredient products to offset raw material and other input cost increases, or if we are unable to achieve cost savings to offset such cost increases, we could fail to meet our cost expectations and our profits and operating results could be adversely affected. Increases in prices of our products to customers may lead to declines in volume, and we may not be able to accurately predict the volume impact of price increases, which could adversely affect our financial condition and results of operations.

Similarly, commodities and energy prices are subject to significant volatility caused by market fluctuations, supply and demand, currency fluctuations, production and transportation disruptions, and other world events. As we source many of our raw materials globally to help ensure quality control, if the cost of energy, shipping or transportation increases and we are unable to pass along these costs to our customers, our profit margins would be adversely affected. Furthermore, increasing our prices to our customers could result in long-term sales declines or loss of market share if our customers find alternative suppliers or choose to reformulate their consumer products to use fewer ingredients, which could have an adverse long-term impact on our results of operations.

To mitigate our sourcing risk, we maintain strategic stock levels for critical items. However, if we do not accurately estimate the amount of raw materials that will be used for the geographic region in which we will need these materials, our margins could be adversely affected.

If we are unable to comply with regulatory requirements and industry standards, including those regarding product safety, quality, efficacy and environmental impact, we could incur significant costs and suffer reputational harm which could adversely affect results of operations.

The development, manufacture and sale of our products are subject to various regulatory requirements in each of the countries in which our products are developed, manufactured and sold. In addition, we are subject to product safety and compliance requirements established by the industry or similar oversight bodies or contractually by our customers, including requirements concerning product safety, quality and efficacy, environmental impacts (including packaging, energy and water use and waste management) and other sustainability or similar issues. We use a variety of strategies, methodologies and tools to (i) identify current product standards, (ii) assess relative risks in our supply chain that can impact product integrity, (iii) monitor internal and external performance and (iv) test raw materials and finished goods to minimize the likelihood of product or process non-compliance.

Gaps in our operational processes or those of our suppliers can result in products that do not meet our quality control standards or industry standards or fail to comply with the relevant regulatory requirements, which in turn can result in finished consumer goods that do not comply with these standards and requirements. Products that are mislabeled, contaminated or damaged could result in a regulatory non-compliance event or even a product recall by the FDA or a similar foreign agency. Our contracts often require us to indemnify our customers for the costs associated with a product non-compliance event, including penalties, costs and settlements arising from litigation, remediation costs or loss of sales. As our flavors and fragrance compounds and ingredients are used in many products intended for human use or consumption, these consequences would be exacerbated if we or our customer did not identify the defect before the product reaches the consumer and there was a resulting impact at the consumer level. Such a result could lead to potentially large scale adverse publicity, negative effects on consumer’s health, recalls and potential consumer litigation. In addition, if we do not have adequate insurance or contractual indemnification from suppliers or other third parties, or if insurance or indemnification is not available, the liability relating to product or possible third-party claims arising from mislabeled, contaminated or damaged products could adversely affect our business, financial condition or results of operations. Furthermore, adverse publicity about our products, or our customers’ products that contain our ingredients, including concerns about product safety or similar issues, whether real or perceived, could harm our reputation and result in an immediate adverse effect on our sales and customer relationships, as well as require us to utilize significant resources to rebuild our reputation.

The interruption or failure of key information technology systems or a loss of data, malicious attack or other breach of security of our information technology systems, may have a material adverse effect on our ability to conduct our business, subject us to increased operating costs, damage our reputation and expose us to litigation.

We rely on information technology systems, including some managed by third-party providers, to conduct business and support our business processes, including product formulas, product development, sales, order processing, production, distribution, internal communications and communications with third parties throughout the world, processing transactions, summarizing and reporting results of operations, complying with regulatory, tax or legal requirements, and collecting and storing customer, supplier, employee and other stakeholder information. The Frutarom acquisition may also pose additional burden on our information technology systems as we integrate our information and financial systems into our newly acquired facilities. These systems may be susceptible to disruptions or outages due to fire, floods, power loss, telecommunications failures, natural disasters, cyber-attacks, failed upgrades or other similar events, or due to the poor performance of third-party providers. An effective response to disruptions will require effort and diligence on the part of our employees and third-party providers to avoid any adverse impact to our business. In addition, our systems and proprietary data stored electronically may be vulnerable to computer viruses, cybercrime, computer hacking and similar information security breaches, which in turn could result in the unauthorized release or misuse of confidential or proprietary information about our business (including, but not limited to, the trade secrets upon which we rely to protect our proprietary fragrance and flavor formulations), employees, or customers, and disrupt our operations. Depending on their nature and scope, these threats could potentially lead to improper use of our systems and networks, manipulation and destruction of data or product non-compliance. The occurrence of any of these events could disrupt our business and have a material adverse effect on our sales, subject us to increased operating costs, damage our reputation and expose us to litigation or regulatory proceedings.

Increasing awareness of health and wellness are driving changes in the consumer products industry, and if we are unable to react in a timely and cost-effective manner, our results of operations and future growth may be adversely affected.

We must continually anticipate and react, in a timely and cost-effective manner, to changes in consumer preferences and demands, including changes in demand driven by increasing awareness of health and wellness and demands for transparency with respect to product ingredients. Consumers, especially in developed economies such as the U.S. and Western Europe, are shifting away from products containing artificial ingredients to all natural, healthier alternatives. In addition, there has been a growing demand by consumers, non-governmental organizations and, to a lesser extent, governmental agencies to provide more transparency in product labeling and our customers have been taking steps to address this demand, including by voluntarily providing product-specific ingredients disclosure. These two trends could affect the types and volumes of our ingredients and compounds that our customers include in their consumer product offerings. If we are unable to react to or anticipate these trends in a timely and cost-effective manner, our results of operations and future growth may be adversely affected.

If we are unable to successfully establish and manage collaborations, joint ventures or partnerships that lead to development or commercialization of products, it could adversely affect our growth.

From time to time, we evaluate and enter into collaborations, joint ventures or partnerships to enhance our research and development efforts or expand our materials portfolio or technology. The process of establishing and maintaining collaborative relationships is difficult and time-consuming to negotiate, document and implement. We may not be able to successfully negotiate these arrangements or the terms of the arrangements may not be as favorable as anticipated. Furthermore, our ability to generate revenues from such collaborations will depend on our partners’ abilities and efforts to successfully perform the functions assigned to them in these arrangements and these collaborations may not lead to development or commercialization of products in the most efficient manner, or at all. In addition, from time to time, Frutarom has acquired, and we intend to continue to acquire, only a majority interest in companies and providing earnouts for the former owners and the ability for us to acquire the minority interests at a future date at an established price. These investments may have additional risks and may not be as efficient as other operations as we may have fiduciary or contractual obligations to the minority investors. If we are unable to successfully establish and manage these collaborative relationships and majority investments it could adversely affect our future growth.

We have made investments in and continue to expand our business into emerging markets, which exposes us to certain risks.

As part of our growth strategy, we have increased our presence in emerging markets by expanding our manufacturing presence, sales organization and product offerings in these markets, and we expect to continue to expand our business in these markets. With our combination with Frutarom, who also had a significant presence in emerging markets, our business in these markets has meaningfully grown. In addition to the currency and international risks described below, our operations in these markets may be subject to a variety of other risks. Emerging markets typically have a consumer base with limited or fluctuating disposable income and customer demand in these markets may fluctuate accordingly. As a result, decrease in customer demand in emerging markets may have an adverse effect on our ability to execute our growth strategy. Further, there is no assurance that our existing products, variants of our existing products or new products that we make, manufacture, distribute or sell will be accepted or be successful in any particular developing or emerging market, due to local or global competition, product price, cultural differences, consumer preferences or otherwise. In addition, emerging markets may have weak legal systems which may affect our ability to enforce our intellectual property and contractual rights, exchange controls, unstable governments and privatization or other government actions that may affect taxes, subsidies and incentive programs and the flow of goods and currency. In conducting our business, we move products from one country to another and may provide services in one country from a subsidiary located in another country. Accordingly, we are vulnerable to abrupt changes in trade, customs and tax regimes in these markets. If we are unable to expand our business in developing and emerging markets, effectively operate, or manage the risks associated with operating in these markets, or achieve the return on capital we expect from our investments in these markets, our operating results and future growth could be adversely affected.

The impact of currency fluctuation or devaluation in the international markets in which we operate may negatively affect our results of operations.

We have significant operations outside the US, the results of which are reported in the local currency and then translated into U.S. dollars at applicable exchange rates for inclusion in our consolidated financial statements. The exchange rates between these currencies and the U.S. dollar have fluctuated and will continue to do so in the future. For example, as of July 1, 2018, we concluded that Argentina's economy is highly inflationary under US GAAP, as it has experienced cumulative inflation of approximately 100% or more over a three-year period. While our current operations in Argentina represent less than 3% of our consolidated net sales and less than 1% of our consolidated total assets, continuing inflation in Argentina could adversely affect our profitability in a specific period. With our increased operations in emerging markets arising from our Frutarom acquisition, these risks will become exacerbated. Changes in exchange rates between these local currencies and the U.S. dollar will affect the recorded levels of sales, profitability, assets and/or liabilities. Additionally, volatility in currency exchange rates may adversely impact our financial condition, cash flows or liquidity. Although we employ a variety of techniques to mitigate the impact of exchange rate fluctuations, including sourcing strategies and a limited number of foreign currency hedging activities, we cannot guarantee that such hedging and risk management strategies will be effective, and our results of operations could be adversely affected.

Our international operations are subject to regulatory, political and other risks that could materially and adversely affect our revenues, cash flows or financial position.

We operate on a global basis, with manufacturing and sales facilities in the US, Europe, Africa, the Middle East, Latin America, Israel and Greater Asia. During 2018, 75% of our net sales and, as a result of our acquisition of Frutarom, 80% of our combined net sales were to customers outside the U.S. and we intend to continue expansion of our international operations. As a result, our business is increasingly exposed to risks inherent in international operations. These risks, which can vary substantially by location, include the following:

- governmental laws, regulations and policies adopted to manage national economic and macroeconomic conditions, such as increases in taxes, austerity measures that may impact consumer spending, monetary policies that may impact inflation rates, currency fluctuations and sustainability of resources;
- changes in environmental, health and safety regulations, such as the continued implementation of the European Union's REACH regulations and similar regulations that are being evaluated and adopted in other markets, and the burdens and costs of our compliance with such regulations;
- increased environmental, health and safety regulations or the loss of necessary environmental permits in certain countries, arising from growing consumer sensitivity concerning the inclusion of flavor additives in food products and the fact that regulators perceive nutraceuticals, medical food and functional food products as having medicinal attributes;
- the imposition of or changes in tariffs, quotas, trade barriers, other trade protection measures and import or export licensing requirements, by the U.S. or other Countries, which could adversely affect our cost or ability to import raw materials or export our flavors and fragrance products to surrounding markets;
- risks and costs arising from language and cultural differences;
- changes in the laws and policies that govern foreign investment in the countries in which we operate, including the risk of expropriation or nationalization, and the costs and ability to repatriate the profit that we generate in these countries;
- risks and costs associated with political and economic instability, bribery and corruption, anti-American sentiment, and social and ethnic unrest in the countries in which we operate;
- difficulty in recruiting and retaining trained local personnel;
- natural disasters, pandemics or international conflicts, including terrorist acts, or national and regional labor strikes in the countries in which we operate, which could interrupt our operations or endanger our personnel; or
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the risks of operating in developing or emerging markets in which there are significant uncertainties regarding the interpretation, application and enforceability of laws and regulations and the enforceability of contract rights and intellectual property rights.

The occurrence of any one or more of these factors could increase our costs and adversely affect our results of operations.

Economic uncertainty may adversely affect demand for our products which may have a negative impact on our operating results and future growth.

Our flavors and fragrance compounds and our fragrance, cosmetic active and functional food ingredients are components of a wide assortment of global consumer products throughout the world. Historically, demand for consumer products using these compounds and ingredients was stimulated and broadened by changing social habits and consumer needs, population growth, an expanding global middle-class and general economic growth, especially in emerging markets. The global economy has experienced significant recessionary pressures and declines in consumer confidence and economic growth. While some segments of the global economy appear to be recovering, the predictions surrounding the global recessionary economic environment in Europe has, and may in the near future, increase unemployment and underemployment, decrease salaries and wage rates, increase inflation or result in other market-wide cost pressures that will adversely affect demand for consumer products in both developed and emerging markets. In addition, growth rates in the emerging markets have moderated from previous levels. Reduced consumer spending may cause changes in our customer orders including reduced demand for our flavors and fragrances compounds or ingredients, or order cancellations.

The timing of placing of orders and the amounts of these orders are generally at our customers' discretion. Customers may cancel, reduce or postpone orders with us on relatively short notice. Significant cancellations, reductions or delays in orders by customers could affect our quarterly results.

It is currently anticipated that these challenging economic uncertainties will continue to affect certain of our markets during 2019 which could adversely affect our sales, profitability and overall operating results.

Our success depends on attracting and retaining talented people within our business. Significant shortfalls in recruitment or retention could adversely affect our ability to compete and achieve our strategic goals.

Attracting, developing, and retaining talented employees, including our perfumers, scientists and flavorists, is essential to the successful delivery of our products and success in the marketplace. Furthermore, as we continue to focus on innovation, our need for scientists and other professionals will increase. An important factor in our ability to realize our anticipated benefits from the Frutarom acquisition is our ability to retain key employees at Frutarom. The ability to attract and retain talented employees is critical in the development of new products and technologies which is an integral component of our growth strategy.

Competition for employees can be intense and if we are unable to successfully integrate, motivate and reward the acquired Frutarom employees or our current employees in our combined company, we may not be able to retain them. However, if we are unable to retain these employees or attract new employees in the future, our ability to effectively compete with our competitors and to grow our business could be adversely affected.

Failure to comply with environmental protection laws may cause us to close, relocate or operate one or more of our plants at reduced production levels, and expose us to civil or criminal liability, which could adversely affect our operating results and future growth.

Our business operations and properties make use of, manufacture, sell, and distribute substances that are sometimes considered hazardous and are therefore subject to extensive and increasingly stringent federal, state, local and foreign laws and regulations pertaining to protection of the environment, including air emissions, sewage discharges, the use of hazardous materials, waste disposal practices and clean-up of existing environmental contamination. Failure to comply with these laws and regulations or any future changes to them may result in significant consequences to us, including the need to close or relocate one or more of our production facilities, administrative, civil and criminal penalties, liability for damages and negative publicity. If we are unable to meet production requirements, we can lose customer orders, which can adversely affect our future growth or we may be required to make incremental capital investments to ensure supply. For example, in 2015 Chinese authorities notified us of compliance issues pertaining to the emission of odors from several of our plants in China and, consequently, we invested approximately $6.5 million in odor-abatement equipment at these facilities and have built a second flavors manufacturing facility in China, with an estimated cost of $45 million. We have also recently completed negotiations with the Chinese government concerning the relocation of a second Fragrance facility in China. Idling of facilities or production modifications has caused or may cause customers to seek alternate suppliers due to concerns regarding supply interruptions and these customers may not return or may order at reduced levels even once issues are remediated. If these non-compliance issues reoccur in China or occur or in any other jurisdiction, we may lose business and may be required to incur capital spending above previous expectations, close a plant, or operate a plant at significantly reduced production levels on a permanent basis, and our operating results and cash flows from operations may be adversely affected.

Our ongoing optimization of our manufacturing facilities may not be as effective as we anticipate, and we may fail to realize the expected cost savings and increased efficiencies.

As part of our ongoing strategy, we seek to enhance our manufacturing efficiency and align our geographic manufacturing footprint with our expectations of future growth and technology needs.

For example, we are in the process of relocating one of our Fragrance Ingredients facilities in China, constructing new facilities in India and Indonesia, and other capital projects required to integrate our recently acquired Frutarom business. The spending associated with these projects may result in capital spending above previous expectations, which could adversely affect our cash flows.

In addition, an integral component of our synergy strategy for the Frutarom acquisition is focused on rationalizing the aggregate number of sites that the combined company operates. Our ability to realize anticipated cost savings and synergies from these activities may be affected by various factors and may pose significant risks, including:

- the risk that we may be unable to successfully and efficiently manufacture the relocated product lines at a different manufacturing facility;
- the risk that we may be unable to effectively reduce overhead and integrate and retain employees of the relocated operations;
- the risk that we may face difficulties in implementing and maintaining consistent standards, controls, procedures, policies and information systems;
- the risk that we may face integrating newly acquired manufacturing, distribution and technology facilities;
- potential strains on our personnel, systems and resources and diversion of attention from other priorities; and
- unforeseen or contingent liabilities of the relocated operations.

Furthermore, actual charges, costs and adjustments due to these activities may vary materially from our estimates, and these activities may require cash and non-cash integration and implementation costs or charges in excess of budgeted amounts, which could offset any such savings and other synergies and therefore could have an adverse effect on our margins.

Our performance may be adversely impacted if we are not successful in managing our inventory and/or working capital balances.

We evaluate our inventory balances of materials based on shelf life, expected sourcing levels, known uses and anticipated demand based on forecasted customer order activity and changes in our product/sales mix. Efficient inventory management is a key component of our business success, financial returns and profitability. To be successful, we must maintain sufficient inventory levels and an appropriate product/sales mix to meet our customers' demands, without allowing those levels to increase to such an extent that the costs associated with storing and holding other inventory adversely impact our financial results. If our buying decisions do not accurately predict sourcing levels, customer trends or our expectations about customer needs are inaccurate, we may have to take unanticipated markdowns or impairment charges to dispose of the excess or obsolete inventory, which can adversely impact our financial results. Additionally, we believe excess inventory levels of raw materials with a short shelf life in our manufacturing facilities subjects us to the risk of increased inventory shrinkage. If we are not successful in managing our inventory balances and shrinkage, our results of and cash flows from operations may be negatively affected.

We sell certain accounts receivable on a non-recourse basis to unrelated financial institutions under "factoring" agreements that are sponsored, solely and individually, by certain customers. The cost of participating in these programs was immaterial to our results in all periods. Should we choose not to participate, or if these programs were no longer available, it could reduce our cash flows from operations in the period in which the arrangement ends.

We could be adversely affected by violations of the U.S. Foreign Corrupt Practices Act or similar U.S. or foreign anti-bribery and anti-corruption laws and regulations in the jurisdictions in which we operate.

The global nature of our business, the significance of our international revenue and our focus on emerging markets create various domestic and local regulatory challenges and subject us to risks associated with our international operations. The U.S. Foreign Corrupt Practices Act, or FCPA, and similar anti-bribery and anti-corruption laws and regulations in other countries generally prohibit companies and their intermediaries from making improper payments to foreign officials for the purpose of obtaining or keeping business or for other commercial advantage. In addition, U.S. public companies are required to maintain records that accurately and fairly represent their transactions and have an adequate system of internal accounting controls. Under the FCPA, U.S. companies may be held liable for the corrupt actions taken by directors, officers, employees, agents, or other strategic or local partners or representatives. As such, if we or our intermediaries fail to comply with the requirements of the FCPA or similar legislation, governmental authorities in the U.S. and elsewhere could seek to impose substantial civil and/or criminal fines and penalties which could have a material adverse effect on our business, reputation, operating results and financial condition.

We operate or may pursue opportunities in some jurisdictions, such as China, India, Brazil, Russia and Africa, which pose potentially elevated risks of fraud or corruption or increased risk of internal control issues. In certain jurisdictions, compliance with anti-bribery laws may conflict with local customs and practices. From time to time, we have conducted and will conduct internal investigations of the relevant facts and circumstances, control testing and compliance reviews, and take remedial actions, when appropriate, to help ensure that we are in compliance with applicable corruption and similar laws and regulations. In addition, Frutarom grew through rapid acquisition and, as part of our integration efforts, we will be seeking to implement our anti-corruption and similar policies throughout a number of those acquired companies, many of which were not previously subject to these U.S. laws.

Detecting, investigating and resolving actual or alleged violations of the FCPA or similar laws is expensive and could consume significant time and attention of our senior management. We could be subject to inquiries or investigations by government and other regulatory bodies. Any allegations of non-compliance with the FCPA or similar laws could have a disruptive effect on our operations in such jurisdiction over the near term, including interruptions of business or loss of third-party relationships, which may negatively impact our results of operations or financial condition. Any determination that our operations or activities are not in compliance with the FCPA or similar laws could expose us to severe criminal or civil penalties or other sanctions, significant fines, termination of necessary licenses and permits, and penalties or other sanctions that may harm our business and reputation.

Our ability to compete effectively depends on our ability to protect our intellectual property rights.

We rely on patents and trade secrets to protect our intellectual property rights. We often rely on trade secrets to protect our proprietary fragrance and flavor formulations, as well as our extract methodologies, and processes for our nutraceutical, natural colors for food and natural antioxidants for food protection, as this does not require us to publicly file information regarding our intellectual property. From time to time, a third party may claim that we have infringed upon or misappropriated their intellectual property rights, or a third party may infringe upon or misappropriate our intellectual property rights. We could incur significant costs in connection with legal actions to assert our intellectual property rights against third parties or to defend ourselves from third party assertions of invalidity, infringement or misappropriation or other claims. Any settlement or adverse judgment resulting from such litigation could require us to obtain a license to continue to use the intellectual property rights that are the subject of the claim, or otherwise restrict or prohibit our use of such intellectual property rights. Any required licensing fees may not be available to us on acceptable terms, if at all. For those intellectual property rights that are protected as trade secrets, this litigation could result in even higher costs, and potentially the loss of certain rights, since we would not have a perfected intellectual property right that precludes others from making, using or selling our products or processes. The ongoing trend among our customers towards more transparent labeling could further diminish our ability to effectively protect our proprietary flavor formulations.

For intellectual property rights that we seek to protect through patents, we cannot be certain that these rights, if obtained, will not later be opposed, invalidated, or circumvented. In addition, even if such rights are obtained in the US, the laws of some of the other countries in which our products are or may be sold do not protect intellectual property rights to the same extent as the laws of the US. If other parties were to infringe on our intellectual property rights, or if a third party successfully asserted that we had infringed on their intellectual property rights, it could materially and adversely affect our future results of operations by (i) reducing the price that we could obtain in the marketplace for products which are based on such rights, (ii) increasing the royalty or other fees that we may be required to pay in connection with such rights or (iii) limiting the volume, if any, of such products that we can sell.

Our results of operations may be negatively impacted by the outcome of uncertainties related to litigation.

From time to time we are involved in a number of legal claims, regulatory investigations and litigation, including claims related to intellectual property, product liability, environmental matters and indirect taxes. For instance, product liability claims may arise due to the fact that we supply flavors and fragrances to the food and beverage, functional food, pharma/nutraceutical and personal care industries. Our manufacturing and other facilities may expose us to environmental claims and regulatory investigations. In addition, as we expand our product offering into functional food, nutraceuticals, and natural antioxidants, we may also be subject to claims of false or deceptive advertising claims in the U.S., Europe and other foreign jurisdictions in which we offer these types of products. These claims can arise as a result of function claims, health claims, nutrient content claims and other claims that impermissibly suggest therapeutic benefits for certain foods or food components. The cost of defending these claims or our obligations for direct damages and indemnification if we were found liable could adversely affect our profitability and our results of operations.

As a result of the acquisition of Frutarom, we assumed a number of legal claims, regulatory investigations and litigation and we may become involved in additional actions in the future arising from the acquired operations. Specifically, as Frutarom has a significantly greater number of facilities that are located globally and a significantly larger number of customers, our exposure to these type of environmental claims, product liability claims and regulatory investigations may increase. This could result in an increase in our cost for defense or settlement of claims or indemnification obligations if we were to be found liable in excess of our historical experience. Our insurance may not be adequate to protect us from all material expenses related to pending and future claims and our current levels of insurance may not be available in the future at commercially reasonable prices. Any of these factors, could adversely affect our profitability and results of operations.

Our funding obligations for our pension and postretirement plans could adversely affect our earnings and cash flows.

The funding obligations for our pension plans are impacted by the performance of the financial markets, particularly the equity markets and interest rates. Funding obligations are determined under government regulations and are measured each year based on the value of assets and liabilities on a specific date. If the financial markets do not provide the long-term returns that are expected under the governmental funding calculations, we could be required to make larger contributions. The equity markets can be very volatile, and therefore our estimate of future contribution requirements can change dramatically in relatively short periods of time. Similarly, changes in interest rates and legislation enacted by governmental authorities can impact the timing and amounts of contribution requirements. An adverse change in the funded status of the plans could significantly increase our required contributions in the future and adversely impact our liquidity.

Assumptions used in determining projected benefit obligations and the fair value of plan assets for our pension and other postretirement benefit plans are determined by us in consultation with outside consultants and advisors. In the event that we determine that changes are warranted in the assumptions used, such as the discount rate, expected long-term rate of return on assets, or expected health care costs, our future pension and postretirement benefit expenses could increase or decrease. Due to changing market conditions or changes in the participant population, the assumptions that we use may differ from actual results, which could have a significant impact on our pension and postretirement liabilities and related costs and funding requirements.

Any future impairment of our tangible or intangible long-lived assets may adversely impact our profitability.

A significant portion of our assets consists of long-lived assets, including tangible assets such as our manufacturing facilities, and intangible assets and goodwill. As a result of numerous recent acquisitions, including the 2018 acquisition of Frutarom, as of December 31, 2018, we had recorded approximately $8.4 billion of intangible assets and goodwill including goodwill and intangible assets related to our acquisitions. After the Frutarom acquisition was completed, for instance, we recorded a significant amount of goodwill and other intangible assets on our consolidated financial statements. Long-lived assets are subject to an impairment analysis whenever events or changes in circumstances indicate the carrying amount of the asset may not be recoverable. For example, the amount of goodwill that we recorded from the Frutarom acquisition could be subject to impairment based upon future adverse changes in our business or prospects, including our inability to recognize the benefits anticipated by the transaction. Additionally, goodwill is subject to an impairment test at least annually. Indicators such as under performance relative to historical or projected future operating results, changes in our strategy for its overall business or use of acquired assets, unexpected negative industry or economic trends, decreased market capitalization relative to net book values, unanticipated competitive activities, change in consumer demand, loss of key personnel and acts by governments and courts may signal that an asset has become impaired. To the extent any of our acquisitions do not perform as anticipated, whether due to internal or external factors, the value of such assets may be negatively affected and we may be required to record impairment charges. Our results of operations and financial position in future periods could be negatively impacted should future impairments of our long-lived assets, including intangible assets or goodwill occur.

Changes in our tax rates, the adoption of new U.S. or international tax legislation, or changes in existing tax laws could expose us to additional tax liabilities that may affect our future results.

We are subject to taxes in the U.S. and numerous foreign jurisdictions. Our future effective tax rates could be affected by changes in the mix of earnings in countries with differing statutory tax rates, changes in the valuation of deferred tax assets and liabilities, changes in liabilities for uncertain tax positions, cost of repatriations or changes in tax laws or their interpretation. Any of these changes could have a material adverse effect on our profitability.

We have and will continue to implement transfer pricing policies among our various operations located in different countries. These transfer pricing policies are a significant component of the management and compliance of our operations across international boundaries and overall financial results. Many countries routinely examine transfer pricing policies of taxpayers subject to their jurisdiction, challenge transfer pricing policies aggressively where there is potential non-compliance and impose significant interest charges and penalties where non-compliance is determined. However, governmental authorities could challenge these policies more aggressively in the future and, if challenged, we may not prevail. We could suffer significant costs related to one or more challenges to our transfer pricing policies.

We are subject to the continual examination of our income tax returns by the Internal Revenue Service and foreign tax authorities in those countries in which we operate, and we may be subject to assessments or audits in the future in any of the countries in which we operate. The final determination of tax audits and any related litigation could be materially different from our historical income tax provisions and accruals, and while we do not believe the results that follow would have a material adverse effect on our financial condition, such results could have a material effect on our income tax provision, net income or cash flows in the period or periods in which that determination is made.

In addition, a number of international legislative and regulatory bodies have proposed legislation and begun investigations of the tax practices of multi-national companies and, in the European Union, the tax policies of certain European Union member states. One of these efforts has been led by the Organisation for Economic Co-operation and Development, an international association of 34 countries including the U.S., which has finalized recommendations to revise corporate tax, transfer pricing, and tax treaty provisions in member countries. Since 2013, the European Commission ("EC") has been investigating tax rulings granted by tax authorities in a number of European Union member states with respect to specific multi-national corporations to determine whether such rulings comply with European Union rules on state aid, as well as more recent investigations of the tax regimes of certain European Union member states. Under European Union law, selective tax advantages for particular taxpayers that are not sufficiently grounded in economic realities may constitute impermissible state aid. If the EC determines that a tax ruling or tax regime violates the state aid restrictions, the tax authorities of the affected European Union member state may be required to collect back taxes for the period of time covered by the ruling. In late 2015 and early 2016, the EC declared that tax rulings, related to other companies, by tax authorities in Luxembourg, the Netherlands and Belgium did not comply with the European Union state aid restrictions. If the EC were to successfully challenge tax rulings applicable to us in any of the member states in which we are subject to taxation, we could be exposed to increased tax liabilities.

The recently adopted U.S. tax legislation may result in additional tax liabilities that may affect our future results and profitability.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act") that significantly revised the U.S. tax code effective January 1, 2018 by, among other things, lowering the corporate income tax rate from a top marginal rate of 35% to a flat 21%, limiting deductibility of interest expense and performance based incentive compensation, transitioning to a territorial system and creating new taxes associated with global operations. The Tax Act impacted our consolidated results of operations during 2018 and is expected to continue to impact our consolidated results of operations in future periods. In future periods, we expect that our effective tax rate will be impacted by the lower U.S. corporate tax rate that will initially be offset by the elimination of the deductibility of performance based incentive compensation, and other provisions of the Tax Act that may impact us prospectively. However, the ultimate impact of the Tax Act will depend on additional regulatory or accounting guidance that may be issued with respect to the Tax Act and any operating and structural changes that we may undertake to permit us to benefit from the new, lower U.S. tax rate prospectively. This could adversely affect our results of operations.

The potential government regulation of certain of our product development initiatives is uncertain, and we may be subject to adverse consequences if we fail to comply with applicable regulations.

As part of our ingredients research program, we seek to enhance our collaboration with research institutions and companies throughout the world, including biotechnology companies. However, it is unclear whether any of our product developments will be classified as genetically modified food products subject to regulation as a biotechnology product. The manufacture of biotechnology products is subject to applicable Current Good Manufacturing Practice (CGMP) regulations as prescribed by the Food and Drug Administration and the applicable standards prescribed by European Commission and the competent authorities of European Union Member States and to other rules and regulations prescribed by foreign regulatory authorities. Compliance with these regulations can be expensive and time consuming. Such regulation could also subject us to requirements for labeling and traceability, which may cause our customers to avoid our affected products and seek our competitors' products. This may result in our inability to realize any benefit from our investment and have an adverse effect on our operating results.

Our business may be negatively impacted as a result of the United Kingdom's expected departure from the European Union in 2019.

We currently manufacture goods in the United Kingdom for distribution in the European Union and vice-versa and therefore may be adversely affected as a result of the United Kingdom's expected departure from the European Union in 2019. The United Kingdom is expected to withdraw from the European Union in March 2019, commonly referred to as "Brexit". Negotiations are still underway to determine the terms of the United Kingdom's withdrawal from the European Union. The progress and outcomes of Brexit negotiations have, and may continue to, create global economic uncertainty, especially as customers and potential customers are unable to currently gauge the future regulations, and therefore costs, that will apply to their operations in the United Kingdom, and between the United Kingdom and the European Union. The withdrawal could, among other outcomes, exacerbate the disruption of the free movement of goods, services and people between the United Kingdom and the European Union, undermine bilateral cooperation in key geographic areas and significantly disrupt trade between the United Kingdom and the European Union or other nations as the United Kingdom pursues independent trade relations. In addition, Brexit has caused legal uncertainty, which could last indefinitely, and may potentially create divergent national laws and regulations as the United Kingdom determines which European Union laws to replace or replicate.

The effects of Brexit will depend on any agreements the United Kingdom makes to retain access to European Union or other markets either during a transitional period or more permanently. Given the lack of comparable precedent, it is unclear what financial, trade and legal implications the withdrawal of the United Kingdom from the European Union would have and how such withdrawal would affect us. Adverse consequences concerning Brexit or the European Union could include deterioration in global economic conditions, instability in global financial markets, political uncertainty, volatility in currency exchange rates, or adverse changes in the cross-border agreements currently in place, any of which could have an adverse impact on our financial results in the future.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

Our principal properties are as follows:

Location	Operation
United States	
Carrollton, TX[(1)]	Production of flavor compounds; flavor laboratories.
Hazlet, NJ[(1)]	Production of fragrance compounds; fragrance laboratories.
Jacksonville, FL	Production of fragrance ingredients.
New York, NY[(1)]	Fragrance laboratories; corporate headquarters.
South Brunswick, NJ[(1)]	Production of flavor compounds and ingredients; flavor laboratories.
Union Beach, NJ	Research and development center.
Winter Haven, FL	Frutarom production of citrus.
Ridgefield, NJ[(1)]	Frutarom production of health products.
Corona, CA[(1)]	Frutarom production of flavors powders and liquids.
Canada	
Montreal	Frutarom production of savory solutions.
Toronto	Frutarom production of savory solutions.
France	
Neuilly[(1)]	Fragrance laboratories.
Grasse	Production of fragrance compounds, and cosmetic ingredients.
Great Britain	
Haverhill	Production of flavor compounds and ingredients, and fragrance ingredients; flavor laboratories.
Hartlepool	Frutarom production of specialty fine ingredients.
Netherlands	
Hilversum	Flavor and fragrance laboratories, and administrative offices.
Tilburg	Production of flavor compounds and ingredients, and fragrance compounds.
Spain	
Benicarló	Production of fragrance ingredients.
Cartagena Murcia	Frutarom production of colors, flavor extracts and food protection.
Murcia	Frutarom production of health ingredients, flavor extracts and food protection.
Egypt	
Cairo	Production of flavor compounds and manufacturing.
Argentina	
Garin	Production of flavor and fragrance compounds; flavor and fragrance laboratories.
Brazil	
Rio de Janeiro	Production of fragrance compounds.
São Paulo	Flavor and fragrance laboratories.
Taubate	Production of flavor compounds and ingredients.
Minas Gerias[(1)]	Frutarom production of taste solutions.
Arroio Do Meio	Frutarom production of savory solutions.
Palmeira de Goias	Frutarom production of savory solutions.
Mexico	
Tlalnepantla	Production of flavor and fragrance compounds; flavor and fragrance laboratories.
Monterrey	Frutarom production of savory solutions.
San Louis Potosi	Frutarom production of savory solutions.

Location	Operation
Peru	
Lima(1)	Frutarom production of flavor and savory solutions and colors.
Guatemala	
Guatemala City	Frutarom production of flavor and savory solutions.
India	
Mumbai(2)	Flavor and fragrance laboratories.
Chennai(2)	Production of flavor compounds and ingredients, and fragrance compounds; flavor laboratories.
New Zealand	
Mut Maunganui	Frutarom production of taste solutions.
Australia	
Dandenong	Production of flavor compounds and flavor ingredients.
China	
Guangzhou(3)	Production of flavor compounds.
Guangzhou(3)	Production of fragrance compounds.
Shanghai(4)	Flavor and fragrance laboratories.
Xin'anjiang(5)	Production of fragrance ingredients.
Zhejiang(3)	Production of fragrance ingredients.
Guang Dong	Frutarom production of taste solutions.
Shanghai	Frutarom production of flavors.
Pucheng	Frutarom production of specialty fine ingredients.
Indonesia	
Jakarta	Production of flavor compounds and ingredients; flavor and fragrance laboratories.
Vietnam	
Ho Chi Minh(1)	Frutarom production of flavors.
Thailand	
Bangkok	Frutarom production of savory solutions.
Japan	
Gotemba	Production of flavor compounds.
Tokyo	Flavor and fragrance laboratories.
Singapore	
Jurong(4)	Production of flavor and fragrance compounds.
Science Park(1)	Flavor and fragrance laboratories.
Poland	
Radzymin	Frutarom production of savory solutions.
Turkey	
Gebze	Production of flavor compounds.
Slovania	
Markovci	Frutarom production of health products.
Skofja	Frutarom production of flavor, food systems and savory powders.
Austria	
Salzburg(1)	Frutarom production of savory solutions.
Switzerland	
Reinach	Frutarom production of food systems.
Niederuzwil	Frutarom production of savory solutions.

Location	Operation
Israel	
Kibbutz Givat-Oz[3]	Production of fragrance ingredients.
Migdal H'aemeq	Frutarom production of health products.
Akko[1]	Frutarom production of savory solutions.
Gilat[1]	Frutarom production of algea.
Belgium	
Olen	Frutarom production of powders.
Germany	
Hamburg	Production of fragrance compounds.
Stadthagen	Frutarom production of health products.
Emmerich	Frutarom production of food systems.
Stuttgart[1]	Frutarom starter culture production for savory.
Sittensen[1]	Frutarom production of savory solutions.
Freilassing	Frutarom production of savory solutions.

(1) Leased.
(2) We have a 93.4% interest in the subsidiary company that owns this facility.
(3) Land is leased and building, machinery and equipment are owned.
(4) Building is leased and machinery and equipment are owned.
(5) We have a 90% interest in the subsidiary company that leases the land and owns the buildings and machinery.

Our principal executive offices and New York laboratory facilities are located at 521 West 57th Street, New York City.

ITEM 3. LEGAL PROCEEDINGS.

We are subject to various claims and legal actions in the ordinary course of our business.

Environmental

Over the past 20 years, various federal and state authorities and private parties have claimed that we are a Potentially Responsible Party ("PRP") as a generator of waste materials for alleged pollution at a number of waste sites operated by third parties located principally in New Jersey and have sought to recover costs incurred and to be incurred to clean up the sites.

We have been identified as a PRP at seven facilities operated by third parties at which investigation and/or remediation activities may be ongoing. We analyze our potential liability on at least a quarterly basis. We accrue for environmental liabilities when they are probable and estimable. We estimate our share of the total future cost for these sites to be less than $3 million.

While joint and several liability is authorized under federal and state environmental laws, we believe the amounts we have paid and anticipate paying in the future for clean-up costs and damages at all sites are not material and will not have a material adverse effect on our financial condition, results of operations or liquidity. This assessment is based upon, among other things, the involvement of other PRPs at most of the sites, the status of the proceedings, including various settlement agreements and consent decrees, and the extended time period over which payments will likely be made. There can be no assurance, however, that future events will not require us to materially increase the amounts we anticipate paying for clean-up costs and damages at these sites, and that such increased amounts will not have a material adverse effect on our financial condition, results of operations or cash flows.

Other

We are also a party to other litigations arising in the ordinary course of our business. We do not expect the outcome of these cases, singly or in the aggregate, to have a material effect on our consolidated financial condition.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

PART II

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

Market Information.

Our common stock is principally traded on the New York Stock Exchange and available on the Tel Aviv Stock Exchange, both under the ticker symbol "IFF".

Approximate Number of Equity Security Holders.

Title of Class	Number of shareholders of record as of February 15, 2019
Common stock, par value 12 1/2¢ per share	1,656

Issuer Purchases of Equity Securities.

None.

Performance Graph.

The following graph compares a shareholder’s cumulative total return for the last five fiscal years as if such amounts had been invested in: (i) our common stock; (ii) the stocks included in the S&P 500 Index; and (iii) a customized Peer Group. The graph is based on historical stock prices and measures total shareholder return, which takes into account both changes in stock price and dividends. The total return assumes that dividends were reinvested daily and is based on a $100 investment on December 31, 2013.

SOURCE: S&P Capital IQ

Due to the international scope and breadth of our business, we believe that a Peer Group comprising international public companies, which are representative of the customer group to which we sell our products, is the most appropriate group against which to compare shareholder returns. See the table below for the list of companies included in our Peer Group.

Peer Group Companies	
Avon Products, Inc.	Hormel Foods Corporation
Campbell Soup Company	Kellogg Company
Church & Dwight Co., Inc.	The Estée Lauder Companies Inc.
The Clorox Company	McCormick & Company, Incorporated
The Coca-Cola Company	McDonald’s Corporation
Colgate-Palmolive Company	Nestle SA
ConAgra Brands, Inc.	PepsiCo, Inc.
Edgewell Personal Care Company[1]	The Procter & Gamble Company
General Mills, Inc.	Revlon, Inc.
Heinz (HJ) Co.[1]	Sensient Technologies Corporation
The Hershey Company	Unilever N.V.
Hillshire Brands Co.[1]	YUM! Brands, Inc.

(1) In July 2012, Sara Lee Corp. spun off certain of its businesses and changed its name to Hillshire Brands Co. Heinz (HJ) Co. was acquired by Hawk Acquisition Holding Corp on June 7, 2013 and has only been included through that date. Hillshire Brands Co. was acquired by Tyson Foods on August 28, 2014 and has only been included through that date. Edgewell Personal Care has been included starting from July 1, 2015 when it spun off from Energizer Holdings.

ITEM 6. SELECTED FINANCIAL DATA.

INTERNATIONAL FLAVORS & FRAGRANCES INC.
QUARTERLY FINANCIAL DATA
(UNAUDITED)

The following selected consolidated financial data is derived from our Consolidated Financial Statements. This data should be read in conjunction with the Consolidated Financial Statements and Notes thereto, and with Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations.

(DOLLARS IN THOUSANDS EXCEPT PER SHARE DATA)

							Net Income (Loss) Per Share			
	Net Sales		Gross Profit[a]		Net Income (Loss)[b]		Basic[e]		Diluted[c][d]	
Quarter	2018	2017	2018	2017	2018	2017	2018	2017	2018	2017
First	$930,928	$828,293	$405,809	$363,083	$129,416	$115,764	$1.63	$1.46	$1.63	$1.45
Second	920,016	842,861	398,717	372,984	99,149	109,795	1.25	1.39	1.25	1.38
Third	907,548	872,940	400,666	380,398	95,716	110,261	1.18	1.39	1.17	1.39
Fourth	1,219,047	854,625	477,515	355,998	15,500	(40,155)	0.09	(0.51)	0.09	(0.51)
	$3,977,539	$3,398,719	$1,682,707	$1,472,463	$339,781	$295,665	$3.81	$3.73	$3.79	$3.72

* See the following chart for (a)-(c) footnote explanations.

Included in the above quarterly results are the following:

(DOLLARS IN THOUSANDS EXCEPT PER SHARE DATA)	Footnotes Gross Profit (a)	Net Income(b)	Diluted EPS (c)	Description
Q1 2018				
Operational Improvement Initiatives	453	732	0.01	Represents accelerated depreciation related to a plant relocation in India and a lab closure in Taiwan.
Acquisition Related Costs	—	(380)	—	Represents adjustments to the contingent consideration payable for PowderPure, and transaction costs related to Fragrance Resources and PowderPure within Selling and administrative expenses.
Restructuring and Other Charges, net	—	548	0.01	Represents severance costs related to the 2017 Productivity Program and Taiwan lab closure.
Gain on Sale of Assets	—	(52)	—	Represents gains on sale of assets.
FDA Mandated Product Recall	5,000	3,804	0.05	Represents management's best estimate of losses related to the previously disclosed FDA mandated recall.
U.S. Tax Reform	—	649	0.01	Represents charges incurred related to enactment of certain U.S. tax legislation changes in December 2017.
Q2 2018				
Operational Improvement Initiatives	403	261	—	Represents accelerated depreciation related to a plant relocation in India.
Acquisition Related Costs	—	(3)	—	Represents adjustments to the contingent consideration payable for PowderPure, and transaction costs related to Fragrance Resources and PowderPure within Selling and administrative expenses.
Integration Related Costs	—	993	0.01	Represents costs related to the integration of David Michael.
Restructuring and Other Charges, net	—	147	—	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	1,001	0.01	Represents gains on sale of assets.
Frutarom Acquisition Related Costs	—	30,446	0.38	Represents transaction-related costs and expenses related to the acquisition of Frutarom. Amount includes $10.6 million of bridge loan commitment fees included in Interest expense, $25.0 million mark-to-market loss adjustment on an interest rate derivative and an $11.0 million mark-to-market gain adjustment on a foreign currency derivative, and $12.5 million of transaction costs included in administrative expenses.
Q3 2018				
Operational Improvement Initiatives	398	220	—	Represents accelerated depreciation related to a plant relocation in India and Taiwan asset write off.
Acquisition Related Costs	—	(2)	—	Represents adjustments to the contingent consideration payable for PowderPure, and transaction costs related to Fragrance Resources and PowderPure within Selling and administrative expenses.
	18	722	0.01	Represents costs related to the integration of Frutarom.

Integration Related Costs				
Restructuring and Other Charges, net	—	699	0.01	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	(1,243)	(0.02)	Represents gains on sale of assets.
FDA Mandated Product Recall	(9,870)	(10,456)	(0.09)	Represents recoveries from the supplier related to the previously disclosed FDA mandated recall.
U.S. Tax Reform	—	(8,151)	(0.10)	Represents charges incurred related to enactment of certain U.S. tax legislation changes in December 2017.
Frutarom Acquisition Related Costs	—	45,433	0.56	Represents transaction-related costs and expenses related to the acquisition of Frutarom. Amount primarily includes $28.8 million of bridge loan commitment fees partially offset by $25.3 million net mark-to-market gains on deal-contingent interest rate derivatives included in Interest expense; $34.9 million make whole payment on the Senior Notes - 2007 and $3.9 million realized loss on a fair value hedge included in Loss on extinguishment of debt; $1.9 million realized gain on a foreign currency derivative included in Other income; and $14.3 million of transaction costs included in administrative expenses.
Q4 2018 Operational Improvement Initiatives	396	262	—	Represents accelerated depreciation related to a plant relocation in India.
Acquisition Related Costs	—	(593)	(0.01)	Represents adjustments to the contingent consideration payable for PowderPure, and transaction costs related to Fragrance Resources and PowderPure within Selling and administrative expenses
Integration Related Costs	84	4,076	0.04	Represents costs related to the integration of the Frutarom acquisition.
Restructuring and Other Charges, net	—	1,672	0.01	Represents severance costs related to the 2017 Productivity Program and costs associated with the termination of agent relationships in a subsidiary.
Gain on Sale of Assets	—	(531)	—	Represents gains on sale of assets.
FDA Mandated Product Recall	(2,315)	(12,872)	(0.02)	Principally represents recoveries from our insurance in the fourth quarter.

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(DOLLARS IN THOUSANDS EXCEPT PER SHARE DATA)	Footnotes Gross Profit (a)	Net Income(b)	Diluted EPS (c)	Description
U.S. Tax Reform	—	32,847	0.30	Represents additional expense based on updated repatriation plans requiring accruals for withholding taxes on deemed repatriation.
Frutarom Acquisition Related Costs	23,550	51,200	0.46	Represents transaction-related costs and expenses related to the acquisition of Frutarom. Amount primarily includes $23.5 million of amortization for inventory "step-up" costs and $39.2 million of transaction costs included in Selling and administrative expenses.
Redemption value adjustment to EPS	—	—	0.03	Represents the adjustment to EPS related to the excess of the redemption value of certain redeemable noncontrolling interests over their existing carrying value.
Q1 2017				
Operational Improvement Initiatives	$621	$ 466	$0.01	Represents accelerated depreciation in Hangzhou, China.
Acquisition Related Costs	5,301	5,650	0.07	Represents the amortization of inventory "step-up" related to the acquisitions of David Michael and PowderPure, included in Cost of goods sold and transaction costs related to the acquisitions of Fragrance Resources and PowderPure, included in Selling and administrative expenses.
Integration Related Costs	88	829	0.01	Represents costs related to the integration of the David Michael and Fragrance Resources acquisitions.
Tax Assessment	—	3,458	0.04	Represents the reserve for payment of a tax assessment related to commercial rent for prior periods.
Restructuring and Other Charges, net	—	7,176	0.09	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	(14)	—	Represents gains on sale of assets.
CTA Realization	—	(12,214)	(0.15)	Represents the release of CTA related to the liquidation of a foreign entity.
Q2 2017				
Operational Improvement Initiatives	445	334	—	Represents accelerated depreciation in Hangzhou, China.
Acquisition Related Costs	5,606	4,806	0.06	Represents the amortization of inventory "step-up" related to the acquisitions of David Michael, Fragrance Resources and PowderPure, included in Cost of goods sold and transaction costs related to the acquisitions of Fragrance Resources and PowderPure, included in Selling and administrative expenses.
Integration Related Costs	98	488	0.01	Represents costs related to the integration of the David Michael and Fragrance Resources acquisitions.
Legal Charges/Credits, net	—	646	0.01	Represents additional charge related to litigation settlement.
Tax Assessment	—	(12)	—	Represents the reversal of a portion of the reserve for payment of a tax assessment related to commercial rent for prior periods.
Restructuring and Other Charges, net	—	866	0.01	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	(46)	—	Represents gains on sale of assets.

FDA Mandated Product Recall	3,500	2,262	0.03	Represents additional charges recognized to accrue for an estimate of the Company's incremental direct costs and customer reimbursement obligations, in excess of the Company's sales value of the recalled products, arising from an FDA mandated recall of consumer products as a result of raw material received and identified by the Company as containing contamination.
Q3 2017				
Operational Improvement Initiatives	407	305	—	Represents accelerated depreciation in Hangzhou, China.
Acquisition Related Costs	5,147	3,487	0.04	Represents the amortization of inventory "step-up" related to the acquisitions of David Michael, Fragrance Resources and PowderPure, included in Cost of goods sold and transaction costs related to the acquisitions of Fragrance Resources and PowderPure, included in Selling and administrative expenses.
Integration Related Costs	131	428	0.01	Represents costs related to the integration of the David Michael and Fragrance Resources acquisitions.
Restructuring and Other Charges, net	—	2,237	0.03	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	(21)	—	Represents gains on sale of assets.
Q4 2017				
Operational Improvement Initiatives	329	247	—	Represents accelerated depreciation in Hangzhou, China.
Acquisition Related Costs	(194)	(68)		Represents the amortization of inventory "step-up" related to the acquisitions of David Michael and Fragrance Resources, included in Cost of goods sold and transaction costs related to the acquisitions of David Michael and Fragrance Resources, included in Selling and administrative expenses.
Integration Related Costs	163	1,102	0.01	Represents costs related to the integration of the David Michael.
Restructuring and Other Charges, net	—	3,967	0.05	Represents severance costs related to the 2017 Productivity Program.
Gain on Sale of Assets	—	(44)	—	Represents gains on sale of property in Brazil.

Footnotes

(DOLLARS IN THOUSANDS EXCEPT PER SHARE DATA)	Gross Profit (a)	Net Income(b)	Diluted EPS (c)	Description
FDA Mandated Product Recall	7,508	4,848	0.06	Represents additional charges recognized to accrue for an estimate of the Company's incremental direct costs and customer reimbursement obligations, in excess of the Company's sales value of the recalled products, arising from an FDA mandated recall of consumer products as a result of raw material received and identified by the Company as containing contamination.
UK Pension Settlement Charges	—	2,243	0.03	Represents pension settlement charges related to one of the Company's UK plans.
U.S. Tax Reform	—	139,172	1.76	Represents charges incurred related to enactment of certain U.S. tax legislation changes in December 2017. The amount includes approximately $38.6 million related to adjustments to net deferred tax assets and $100.6 million related to a liability for taxes on deemed repatriation of earnings.

(d) The sum of the 2018 and 2017 Net Income per diluted share by quarter does not equal the earnings per share for the full year due to rounding.

(e) The sum of the 2018 Net Income per basic share by quarter does not equal the earnings per share for the full year due to the impact of higher shares in the third and fourth quarters.

INTERNATIONAL FLAVORS & FRAGRANCES INC.
FIVE-YEAR SUMMARY
(DOLLARS IN THOUSANDS EXCEPT PER SHARE AND PERCENTAGE AMOUNTS)

	Year Ended December 31,				
	2018	2017 (j)	2016 (j)	2015	2014
Consolidated Statement of Income Data					
Net sales	$3,977,539	$3,398,719	$3,116,350	$3,023,189	$3,088,533
Cost of goods sold[(a)]	2,294,832	1,926,256	1,720,787	1,672,308	1,725,823
Gross profit	1,682,707	1,472,463	1,395,563	1,350,881	1,362,710
Research and development expenses	311,583	295,469	258,863	245,605	249,173
Selling and administrative expenses[(b)]	707,461	570,144	572,518	494,097	502,121
Restructuring and other charges, net[(c)]	5,079	19,711	(1,700)	7,594	1,298
Amortization of acquisition-related intangibles	75,879	34,693	23,763	15,040	7,328
Gain on sales of fixed assets	(1,177)	(184)	(10,836)	—	—
Operating profit	583,882	552,630	552,955	588,545	602,790
Interest expense	132,558	65,363	52,989	46,062	46,067
Loss on extinguishment of debt[(d)]	38,810	—	—	—	—
Other (income) expense, net[(e)]	(35,243)	(49,778)	(23,751)	3,382	7,662
Income before taxes	447,757	537,045	523,717	539,101	549,061
Taxes on income[(f)]	107,976	241,380	118,686	119,854	134,518
Net income	339,781	295,665	405,031	419,247	414,543
Net income attributable to noncontrolling interests	2,479	—	—	—	—
Net income attributable to IFF stockholders	$337,302	$295,665	$405,031	$419,247	$414,543
Percentage of net sales	8.5	8.7	13.0	13.9	13.4
Percentage of average shareholders' equity	8.8	17.8	26.0	26.9	27.7
Net income per share — basic	$3.81	$3.73	$5.07	$5.19	$5.09
Net income per share — diluted	$3.79	$3.72	$5.05	$5.16	$5.06
Average number of diluted shares (thousands)	88,121	79,370	79,981	80,891	81,494
Consolidated Balance Sheet Data					
Cash and cash equivalents	$634,897	$368,046	$323,992	$181,988	$478,573
Receivables, net	937,765	663,663	550,658	537,896	493,768
Inventories	1,078,537	649,448	592,017	572,047	568,729
Property, plant and equipment, net	1,241,152	880,580	775,716	732,794	720,268
Goodwill and intangible assets, net[(g)]	8,417,710	1,572,075	1,365,906	1,247,393	752,041
Total assets	12,889,395	4,598,926	4,016,984	3,702,010	3,494,621
Bank borrowings, overdrafts and current portion of long-term debt	48,642	6,966	258,516	132,349	8,090
Long-term debt	4,504,417	1,632,186	1,066,855	935,373	934,232
Redeemable noncontrolling interests	81,806	—	—	—	—
Total Shareholders' equity[(h)]	6,043,374	1,689,294	1,631,134	1,594,989	1,522,689
Other Data					
Current ratio[(i)]	2.6	2.5	1.8	2.0	3.3
Additions to property, plant and equipment	$170,094	$128,973	$126,412	$101,030	$143,182
Depreciation and amortization expense	173,792	117,967	102,469	89,597	89,354
Cash dividends declared per share	$2.84	$2.66	$2.40	$2.06	$1.72
Number of shareholders of record at year-end	1,276	1,735	1,892	2,013	2,105
Number of employees at year-end	13,209	7,299	6,932	6,732	6,211

(a) The 2018 amount includes $23.6 million of costs related to the fair value step-up for the Frutarom acquisition, $7.1 million of net reimbursements from suppliers related to the previously disclosed FDA mandated recall, $1.7 million of operational improvement initiative costs consisting of accelerated depreciation and asset write-offs, and $0.1 million of integration costs related to the David Michael and Frutarom acquisitions. The 2017 amount includes $15.9 million of costs related to the fair value step-up for the Fragrance Resources and PowderPure acquisitions, $1.8 million of operational improvement initiative costs consisting of accelerated depreciation, FDA mandated product recall costs of $11.0 million, and $0.5 million of integration costs related to the 2017 Productivity Program. The 2016 amount includes $7.6 million of costs related to the fair value step-up for the David Michael and Lucas Meyer acquisitions, $2.4 million of operational improvement initiative costs consisting of accelerated depreciation and $0.7 million of accelerated depreciation related to restructuring activities. The 2015 amount includes $6.8 million of costs related to the fair value step-up of inventory for the Ottens Flavors and Lucas Meyer acquisitions and $1.1 million of operational improvement initiative costs in Europe and Asia. The 2014 amount includes $7.6 million of accelerated depreciation associated with the Fragrance Ingredients rationalization and operational improvement initiative costs in Europe and Asia.

(b) The 2018 amount includes $66.1 million of transaction costs related to acquisition of Frutarom, $6.1 million of integration costs related to the David Michael and Frutarom acquisitions, and $1.3 million of transaction costs related to the acquisitions of Fragrance Resources and PowderPure. The 2017 amount includes $4.5 million of costs related to the Fragrance Resources and PowderPure acquisitions, $3.3 million of integration costs related to the 2017 Productivity Program, $1.0 million of additional charge related to litigation settlement, $5.3 million of reserve for payment of a tax assessment related to commercial rent for prior periods and $1.9 million of UK pension settlement charges. The 2016 amount includes $48.5 million of legal charges/credits principally related to litigation accrual, $4.5 million of acquisition-related costs related to the acquisitions of Lucas Meyer, David Michael and Fragrance Resources and $1.4 million of severance costs related to the termination of a former executive officer. The 2015 amount includes $10.5 million of reversal of the previously recorded provision for the Spanish capital tax case, $7.2 million of expense for the acceleration of the contingent consideration payments related to the Aromor acquisition and $11.5 million of acquisition-related costs for the Ottens and Lucas Meyer acquisitions.

(c) For 2018, represents severance costs related to the 2017 Productivity Program and costs associated with the termination of agent relationships in a subsidiary. For 2017, represents severance costs related to the 2017 Productivity Program. For 2016, represents accelerated depreciation related to restructuring initiatives and severance costs related to the termination of a former executive officer and partial reversal of restructuring accruals recorded in the prior year. For 2015 and 2014, restructuring and other charges were the result of various restructuring and reorganization programs of the Company.

(d) For 2018, represents a $34.9 million make whole payment on the Senior Notes - 2007 and a $3.9 million realized loss on the termination of a fair value hedge in connection with the acquisition financing of Frutarom.

(e) The 2017 amount includes $12.2 million from the release of CTA related to the liquidation of a foreign entity.

(f) The 2018 amount includes an additional charge based on updated repatriation plans requiring a $32.8 million accrual of a deferred tax liability for foreign withholding and other taxes, including state taxes, on deemed repatriation. For 2017, represents charges incurred related to enactment of certain U.S. tax legislation changes in December 2017, including $38.6 million related to net adjustments on deferred tax assets, and $100.6 million related to taxes on deemed repatriation of earnings. The 2015 amount includes $10.5 million of settlements due to favorable tax rulings in jurisdictions for which reserves were previously recorded for ongoing tax disputes.

(g) The 2018 amount includes $6.9 billion in identifiable intangible assets and goodwill related to our acquisition of Frutarom.

(h) Includes noncontrolling interests for all periods presented.

(i) Current ratio is equal to current assets divided by current liabilities.

(j) The amounts for 2017 and 2016 have been adjusted to reflect the adoption of ASU 2017-07, which required that employers who present a measure of operating income in their statement of income to include only the service cost component of net periodic pension cost and postretirement costs in operating expenses. The impact of the adoption of this standard was a decrease in operating profit by approximately $28.8 million and $14.4 million for the fiscal year 2017 and 2016, respectively, and corresponding increases in Other (income) expense, net.

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

(UNLESS INDICATED OTHERWISE, DOLLARS IN MILLIONS EXCEPT PER SHARE AMOUNTS)

Overview

Frutarom acquisition

On October 4, 2018, we completed the acquisition of Frutarom Industries Ltd. (“Frutarom”). We acquired 100% of the equity of Frutarom pursuant to a definitive agreement and plan of merger entered into on May 7, 2018. Frutarom is an Israeli company that, through its subsidiaries, develops, produces and markets tastes, flavors and fine ingredients used in manufacturing food, beverages, flavors and fragrances, pharma/nutraceuticals, cosmetics and personal care products, primarily focused on natural products. The acquisition was made in order to strengthen and broaden our customer base, capabilities and geographic reach, and is expected to result in exposure to more end markets, including those with a focus on naturals and health and wellness.

The consideration paid to Frutarom shareholders was funded with (i) borrowings under our term loan credit agreement, (ii) amounts received from our offering of common stock that closed in September 2018, (iii) amounts received from our offering of TEUs that closed in September 2018, (iv) amounts received from our offering of €1.1 billion aggregate principal amount of senior unsecured euro-denominated notes that closed in September 2018, (v) amounts received from our offering of $1.5 billion aggregate principal amount of senior unsecured U.S. dollar-denominated notes that closed in September 2018 and (vi) the issuance of approximately 14.9 million shares of our common stock, which resulted in former Frutarom shareholders holding approximately 14.0% of our outstanding common stock at closing.

The transaction was valued, based on our stock price as of October 4, 2018, at approximately $7 billion, including the assumption of approximately $695 million of Frutarom's net debt, which we repaid concurrent with the closing of the transaction. Frutarom's operating results have been included in our operating results from October 4, 2018.

Company background

We are a leading innovator of sensory experiences that move the world. We co-create unique products that consumers taste, smell, or touch. Our expanded geographical footprint and product portfolio position us to better serve both our global customers and the growing regional, mid-sized and smaller specialty customers.

Through the acquisition of Frutarom, we increased our product portfolio with complementary adjacencies, such as natural colors, anti-oxidants for food preservation, nutraceuticals, ingredients for infant formula and proteins for elderly nutrition, and expanded core product lines with savory solutions aimed at the meat and fish industry, citrus and other naturals flavors, specialty ingredients and new cosmetic actives. As a result, we now have over 90,000 products within our portfolio that are provided to customers in approximately 195 countries, which includes a significant number of faster-growing small and mid-sized customers.

The 2018 combined sales of IFF and Frutarom, which combines the full year 2018 sales of both Frutarom and IFF, was approximately $5.1 billion which, management believes, makes us the second largest company in the taste, scent and nutrition industry. We expect that our combined cultures of innovation and partnership will allow us to further capitalize on this expansion to continue to offer our customers innovative and differentiated products. Based on our 2018 combined sales, approximately 35% of our customers are global consumer products companies while approximately 65% of our customers are small and mid-sized companies.

During the past few years, through acquisitions and the development of Tastepoint, we have leveraged our expertise to expand our North American mid-sized customer base. With the acquisition of Frutarom, which was principally focused on serving small and mid-sized companies globally, we have significantly increased our exposure to these faster-growing customers.

We operate in three business segments, Taste (previously "Flavors"), Scent (previously "Fragrances") and, commencing upon its acquisition, Frutarom. In 2018, our Taste business represented 44% of our sales, our Scent business represented 47% of sales and Frutarom represented 9% of sales. Based on our 2018 combined sales, our Taste business represented 34% of sales, our Scent business represented 36% of sales and Frutarom represented 30% of sales.

We are a global leader in the creation of fragrance compounds that are integral elements in the world's finest perfumes and best-known consumer products within fabric care, home care, personal wash, hair care and toiletries products. Our Scent business consists of Fragrance Compounds and Fragrance Ingredients. Our Fragrance Compounds are defined into two broad categories, Fine Fragrances and Consumer Fragrances. Consumer Fragrances consists of five end-use categories of products: (1) Fabric Care, (2) Home Care, (3) Personal Wash, (4) Hair Care and (5) Toiletries. Fragrance Ingredients consist of active and functional ingredients that are used internally and sold to third parties, including customers and competitors, and are included in the Scent business unit.

Flavors are the key building blocks that impart taste experiences in food and beverage products and, as such, play a significant role in determining consumer preference for the end products in which they are used. As a leading creator of Flavor Compounds, we help our customers deliver on the promise of delicious and healthy foods and drinks that appeal to consumers. While we are a global leader, our flavors business is more regional in nature, with different formulas that reflect local taste preferences. Consequently, we manage our flavors business geographically, creating Flavor Compounds in our regional creative centers which allow us to satisfy local taste preferences, while also helping to ensure regulatory compliance and production standards. We develop thousands of different flavors and taste offerings for our customers, most of which are tailor-made. We continually develop new formulas to meet changing consumer preferences and customer needs. Our Flavor Compounds are ultimately used by our customers in the following four end-use categories of consumer goods: (1) Savory, (2) Beverages, (3) Sweet and (4) Dairy.

Our Frutarom business creates and manufactures a naturals-focused suite of Flavor Compounds and specialty fine ingredients, largely targeting small, local and regional customers. Our Frutarom business seeks to capitalize on the health and wellness emphasis of consumers and deliver growth by offering customers natural flavor products that combine solutions to create natural colors, extending shelf life and natural functional food ingredients. Frutarom's products are focused on three principal areas: (1) Savory Solutions, (2) Natural Product Solutions, which includes natural health ingredients, natural color and natural food protection, and (3) Taste Solutions.

2018 FINANCIAL PERFORMANCE OVERVIEW

Sales in 2018 increased 17% on a reported basis and 15% on a currency neutral basis (which excludes the effects of changes in currency), with the effects of the Frutarom acquisition contributing approximately 11% to reported growth rates and 10% to currency neutral growth rates. Taste achieved reported sales growth of 6% and currency neutral sales growth of 5%. Scent achieved sales growth of 6% on a reported basis and 4% on a currency neutral basis in 2018. From a geographic perspective, North America ("NOAM"), Europe, Africa and Middle East ("EAME"), Greater Asia ("GA") and Latin America ("LA") all delivered sales growth on a consolidated basis in 2018, led by EAME.

Overall, our 2018 results continued to be driven by our strong emerging market presence that represented 48% of total sales and experienced 17% growth on a reported basis and 16% growth on a currency neutral basis in 2018. We continue to benefit from our diverse portfolio of products and geographies and had sales growth in our Taste and Scent business units. Both Taste and Scent benefited from new win performance (net of losses). Exchange rate variations did not have a material impact on revenue in 2018. The effect of exchange rates can vary by business and region depending upon the mix of sales by country as well as the relative percentage of local sales priced in U.S. dollars versus local currencies. We saw currency neutral sales growth during each quarter of 2018.

Our 25 largest customers accounted for 47% of total sales in 2018; this percentage has remained fairly constant for several years. Sales to our largest customer across all end-use categories accounted for 9% to 12 % of our sales for each of the last three fiscal years. A key factor for commercial success is inclusion on our strategic customers' core supplier lists, which provides opportunities to win new business. We are on the core supplier lists of a large majority of our global and strategic customers within flavors and fragrances.

Gross margin decreased 102 basis points ("bps") year-over-year, driven primarily by unfavorable price versus input costs (including the net impact of the BASF supply disruption), which was only partially offset by cost savings and productivity initiatives. Included in 2018 was $23.6 million of Frutarom acquisition related inventory "step-up" costs, $1.7 million of costs associated with operational improvement initiatives and $0.1 million of integration related costs, offset by $7.1 million income from net insurance recoveries from the previously disclosed FDA mandated product recall, compared to $15.9 million of acquisition-related inventory "step-up" costs, $11.0 million related to the FDA mandated product recall, $1.8 million of costs associated with operational improvement initiatives and $0.5 million of integration related costs in 2017. Excluding these items, adjusted gross margin decreased 142 bps compared to the prior year period.

Operating profit increased $31.3 million to $583.9 million (14.7% of sales) in 2018 compared to $552.6 million (16.3% of sales) in 2017. Included in 2018 were Frutarom acquisition related costs of $89.6 million, integration related costs of $7.2 million, restructuring and other charges of $4.1 million and operational improvement initiative costs of $2.2 million, partially offset by $7.1 million in income from net insurance recoveries from the previously disclosed FDA mandated product recall, acquisition related costs of $1.3 million and gain on sale of fixed assets of $1.2 million. Included in 2017 were restructuring and other charges of $19.7 million, acquisition-related costs of $20.4 million, $11.0 million relating to an FDA mandated product recall, reserve for payment of a tax assessment related to commercial rent for prior periods of $5.3 million, integration related costs of $4.2 million, pension settlement charges of $2.8 million, operational improvement initiative costs of $1.8 million and an additional charge related to litigation settlement of $1.0 million, partially offset by gain on sale of fixed assets of $0.2 million. Excluding these charges, adjusted operating profit was $677.4 million for 2018, an increase from $618.6 million for 2017, principally driven by volume growth, the impact of foreign exchange, and cost and productivity initiatives which was partially offset by price to input costs (including the impact of the BASF supply chain disruption) and increases Selling and administrative expenses. Foreign currency had a 3% favorable impact on operating profit in the 2018 period compared to a 1% unfavorable impact on operating profit in the 2017 period. Operating profit as a percentage of sales, excluding the above charges, decreased from 17.0% for 2018 compared to 18.2% for 2017, principally driven by lower margins as a result of price to input costs (including the net impact of the BASF supply chain disruption) and increases in Selling and administrative expenses, offset by cost and productivity initiatives and new win performance (net of losses)

Cash flows from operations were $437.6 million or 11.0% of sales in 2018 as compared to cash flows from operations of $390.8 million, or 11.5% of sales, during 2017. The increase in operating cash flows in 2018 as compared to 2017 was principally driven by lower litigation settlement and pension payments and higher net income, offset by higher net working (principally related to inventories).

Our capital spend was $170.1 million (4.3% of sales) during 2018. In light of our requirement to begin relocating one of our Fragrance Ingredients facilities in China, the ongoing construction of new facilities in India and Indonesia, and capital requirements to integrate our recently acquired Frutarom business, we expect that capital spending in 2019 will be about 5-6% of sales (net of potential grants and other reimbursements from government authorities).

Effective the first quarter of 2018, we adopted new accounting guidance related to revenue recognition and the presentation of pension costs. The revenue recognition guidance was adopted effective the first day of fiscal 2018 and prior period amounts were not revised to conform to the new guidance. The adoption of the new revenue guidance did not have a material impact on our results of operations. The guidance related to the presentation of pension costs was applied retroactively and prior period amounts have been adjusted to conform to the new guidance. As noted in Note 16 to the Consolidated Financial Statements, the net effect of the change was to decrease operating profit and increase Other income.

2019 OUTLOOK

We believe that market conditions and the macro-economic environment will continue to be volatile in many markets in 2019 but that overall, there will be slight improvements as compared to recent years. Pressures from increasing costs and the impact of supply chain disruptions related to key ingredients used in the flavors and fragrance industry may reduce our currency neutral operating profit growth in 2019.

During 2018, the raw material cost environment continued its recent upward trend. We believe that, for the next several quarters, we will continue to see higher costs of raw materials across a range of categories. Raw material costs continue to be impacted by supply chain disruptions, mainly impacting our Scent business unit. We continue to seek improvements in our margins through operational performance, cost reduction efforts and mix enhancement as well as integration savings with Frutarom.

On a long-term basis, we expect that sales growth for the industry will generally be in line with the underlying assumptions that support our long-term strategic goals, albeit with some risk in the near term given the continuing global economic uncertainty. We believe changing social habits resulting from increased disposable income, improved focus on personal health and wellness awareness should help drive growth of our consumer product customers' businesses.

Results of Operations

(DOLLARS IN THOUSANDS EXCEPT PER SHARE AMOUNTS)	Year Ended December 31, 2018	2017	2016	Change 2018 vs. 2017	2017 vs. 2016
Net sales	$3,977,539	$3,398,719	$3,116,350	17.0 %	9.1 %
Cost of goods sold	2,294,832	1,926,256	1,720,787	19.1 %	11.9 %
Gross profit	1,682,707	1,472,463	1,395,563		
Research and development (R&D) expenses	311,583	295,469	258,863	5.5 %	14.1 %
Selling and administrative (S&A) expenses	707,461	570,144	572,518	24.1 %	(0.4)%
Restructuring and other charges, net	5,079	19,711	(1,700)	(74.2)%	NMF
Amortization of acquisition-related intangibles	75,879	34,693	23,763	118.7 %	46.0 %
Gain on sale of fixed assets	(1,177)	(184)	(10,836)	NMF	(98.3)%
Operating profit	583,882	552,630	552,955		
Interest expense	132,558	65,363	52,989	102.8 %	23.4 %
Loss on extinguishment of debt	38,810	—	—	— %	— %
Other income, net	(35,243)	(49,778)	(23,751)	(29.2)%	109.6 %
Income before taxes	447,757	537,045	523,717		
Taxes on income	107,976	241,380	118,686	(55.3)%	103.4 %
Net income	$339,781	$295,665	$405,031		
Net income attributable to non-controlling interest	2,479	—	—	NMF	NMF
Net income attributable to IFF stockholders	337,302	295,665	405,031		
Net income per share — diluted	$3.79	$3.72	$5.05	1.8 %	(26.3)%
Gross margin	42.3 %	43.3 %	44.8 %	(101.9)	(145.8)
R&D as a percentage of sales	7.8 %	8.7 %	8.3 %	(86.0)	38.7
S&A as a percentage of sales	17.8 %	16.8 %	18.4 %	101.1	(159.6)
Operating margin	14.7 %	16.3 %	17.7 %	(158.0)	(148.4)
Adjusted operating margin (1)	17.0 %	18.2 %	20.2 %	(117.2)	(199.8)
Effective tax rate	24.1 %	44.9 %	22.7 %	NMF	NMF
Segment net sales					
Taste	$1,737,349	$1,632,166	$1,496,525	6.4 %	9.1 %
Scent	1,880,630	1,766,553	1,619,825	6.5 %	9.1 %
Frutarom	359,560	—	—	NMF	NMF
Consolidated	$3,977,539	$3,398,719	$3,116,350		

NMF: Not meaningful

(1) Adjusted operating margin for the year ended December 31, 2018 excludes Frutarom acquisition related costs of $89.6 million, integration related costs of $7.2 million, restructuring and other charges of $4.1 million, and operational improvement initiatives of $2.2 million, partially offset by FDA mandated product recall of $7.1 million, acquisition related costs of $1.3 million, and gain on sale of assets of $1.2 million.

Adjusted operating margin for the year ended December 31, 2017 excludes net legal charges/credits of $1.0 million, acquisition related costs of $20.4 million, gain on sale of assets of $0.2 million, operational improvement initiative costs of $1.8 million, restructuring and other charges, net of $19.7 million, FDA mandated product recall costs of $11.0 million, UK pension settlement charge of $2.8 million, tax assessment of $5.3 million, and integration related costs of $4.2 million.

Adjusted operating margin for the year ended December 31, 2016 excludes net legal charges/credits of $48.5 million, acquisition related costs of $12.2 million, gain on sale of assets of $7.8 million, operational improvement initiative costs of $2.4 million and restructuring and other charges, net of $0.3 million.

Cost of goods sold includes the cost of materials and manufacturing expenses; raw materials generally constitute approximately 50% of total inventory. R&D expenses relate to the development of new and improved molecules and technologies, technical product support and compliance with governmental regulations. S&A expenses include expenses necessary to support our commercial activities and administrative expenses principally associated with staff groups that support our overall operating activities.

2018 IN COMPARISON TO 2017

Frutarom's operating results have been included in our operating results from October 4, 2018.

Sales

Sales for 2018 totaled $4.0 billion, an increase of 17% from the prior year on a reported and 15% on a currency neutral basis. Sales growth reflected new win performance (net of losses) and favorable price to input costs in both Taste and Scent. On a reported and currency neutral basis, the effect of the acquisition of Frutarom was approximately 11% and 10%, respectively, to net sales amounts.

Sales performance by segment was as follows:

	% Change in Sales — 2018 vs. 2017	
	Reported	Currency Neutral[1]
Taste	6 %	5 %
Scent	6 %	4 %
Frutarom	— %	— %
Total	17 %	15 %

(1) Currency neutral sales growth is calculated by translating prior year sales at the exchange rates for the corresponding 2018 period.

Taste

Taste sales in 2018 increased 6% on a reported basis and 5% on a currency neutral basis versus the prior year period. Overall growth was primarily driven by new win performance (net of losses) and price increases (principally due to increases in raw material input costs). The Taste business delivered currency neutral growth across all regions.

Sales growth in the Taste business unit was led by NOAM, which were primarily driven by new wins and price increases (principally due to increases in raw material input costs), and followed by EAME. GA and LA sales growth was primarily driven by new wins.

Scent

Scent sales in 2018 increased 6% on a reported basis and 4% on a currency neutral basis. Year-over-year, 2018 sales growth reflected new win performance (net of losses) and price increases (principally due to increases in raw material input costs), which were partially offset by volume reductions on existing business.

Sales growth in the Scent business unit was led by Ingredients, which were primarily driven by price increases (principally due to increases in raw material input costs), followed by Fragrance Compounds, primarily driven by new wins partially offset by volume reductions on existing business.

Frutarom

Frutarom sales in 2018 were $359.6 million, which included approximately $264 million in sales of Flavor Compounds and approximately $97 million in sales of Ingredient product categories.

Cost of Goods Sold

Cost of goods sold, as a percentage of sales, increased 102 bps, to 57.7% in 2018 compared to 56.7% in 2017. Included in cost of goods sold was $23.6 million of Frutarom acquisition related inventory "step-up" costs, $1.7 million of costs associated with operational improvement initiatives, and $0.1 million of integration related costs, partially offset by $7.1 million related to an FDA mandated product recall, in 2018. For 2017, included in costs of goods sold was $15.9 million of acquisition-related inventory "step-up" costs, $11.0 million related to an FDA mandated product recall, $1.8 million of costs associated with operational improvement initiatives, and $0.5 million of integration related costs.

Research and Development (R&D)

Overall R&D expenses, as a percentage of sales, decreased to 7.8% in 2018 compared to 8.7% in 2017. The decrease in 2018 was principally driven by the effect of the acquisition of Frutarom which has a lower R&D spend as a percent of sales.

Selling and Administrative (S&A)

S&A expenses increased $137.3 million to $707.5 million, or 17.8% as a percentage of sales, in 2018 compared to $570.1 million, or 16.8% as a percentage of sales, in 2017. Included in 2018 were Frutarom acquisition related costs of $66.1 million and integration related costs of $6.1 million, partially offset by acquisition related costs of $1.3 million, compared to commercial real estate tax assessment charges of $5.3 million, acquisition and integration related costs of $4.5 million and $3.3 million, respectively, UK pension settlement charge of $1.9 million and net legal charges/credits, principally related to a litigation accrual of $1.0 million in 2017. Excluding these costs, adjusted S&A expense increased by $82.5 million, but decreased to16.0% of sales in 2018 compared to 16.3% of sales in 2017. The improved leverage is principally due to a decline in personnel related costs and the impact of our acquisition of Frutarom.

Restructuring and Other Charges

Restructuring and other charges primarily consist of separation costs for employees, including severance, outplacement and other benefit costs.

	For the Year Ended December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
Taste	$1,646	$4,505
Scent	3,433	13,077
Global	—	2,129
Total	$5,079	$19,711

2017 Productivity Program

On February 15, 2017, the Company announced that it was adopting a multi-year productivity program designed to improve overall financial performance, provide flexibility to invest in growth opportunities and drive long-term value creation. In connection with this program, we expect to optimize our global footprint and simplify the Company's organizational structures globally.

The Company recorded $3.9 million and $20.6 million of charges related to personnel-related costs in 2018 and 2017, respectively, with no further anticipated personnel-related and other costs after the first quarter of 2019. The Company made payments of $7.3 million and $14.0 million related to severance in 2018 and 2017, respectively. The overall charges were split approximately evenly between Taste and Scent. No charges were allocated to the Frutarom segment. This initiative is expected to result in the reduction of approximately 370 members of the Company’s global workforce, including acquired entities, in various parts of the organization.

Amortization of Acquisition-Related Intangibles

Amortization expenses increased to $75.9 million in 2018 compared to $34.7 million in 2017. The increase of $41.2 million is principally due to the acquisition of Frutarom.

Operating Results by Business Unit

We evaluate the performance of business units based on segment profit which is defined as operating profit before Restructuring and certain non-recurring items, Interest expense, Other expense, net and Taxes on income. See Note 15 to our Consolidated Financial Statements for the reconciliation to Income before taxes.

(DOLLARS IN THOUSANDS)	For the Year Ended December 31, 2018	2017
Segment profit:		
Taste	$395,190	$360,483
Scent	329,548	318,954
Frutarom	27,358	—
Global Expenses	(74,730)	(60,810)
Operational Improvement Initiatives	(2,169)	(1,802)
Acquisition Related Costs	1,289	(20,389)
Integration Related Costs	(7,188)	(4,179)
Legal Charges/Credits, net	—	(1,000)
Tax Assessment	—	(5,331)
Restructuring and Other Charges, net	(4,086)	(19,711)
Gain on Sale of Assets	1,177	184
FDA Mandated Product Recall	7,125	(11,000)
UK Pension Settlement Charges	—	(2,769)
Frutarom Acquisition Related Costs[1]	(89,632)	—
Operating Profit	$583,882	$552,630
Profit margin		
Taste	22.7 %	22.1 %
Scent	17.5 %	18.1 %
Frutarom	7.6 %	NMF
Consolidated	14.7 %	16.3 %

NMF: Not meaningful

(1) Includes $23.6 million related to amortization of inventory "step-up" costs.

Taste Business Unit

Taste segment profit increased $34.7 million to $395.2 million (22.7% of segment sales) in 2018 from $360.5 million (22.1% of segment sales) in the comparable 2017 period. The increase principally reflected the impact of cost savings and productivity initiatives and the impact of foreign exchange, partially offset by increases in Selling and administrative expenses.

Scent Business Unit

Scent segment profit increased $10.6 million to $329.5 million in 2018, compared to $319.0 million reported in 2017 primarily due to new win performance (net of losses) and price increases (principally due to increases in raw material input costs), which were partially offset by volume reductions on existing business. Segment profit as a percentage of segment sales decreased to 17.5% in 2018 from 18.1% in 2017 primarily due to the impact of unfavorable price versus input costs (including the net impact of the BASF supply chain disruption) and increases in R&D and Selling and administrative expenses, partially offset by new win performance (net of losses).

Frutarom Business Unit

Frutarom segment profit was $27.4 million for the fourth quarter of 2018 (7.6% of segment sales), excluding $23.6 million related to amortization of inventory "step-up" costs.

Global Expenses

Global expenses represent corporate and headquarter-related expenses which include legal, finance, human resources and R&D and other administrative expenses that are not allocated to an individual business unit. In 2018, Global expenses were $74.7 million compared to $60.8 million during 2017. The increase was principally driven by lower gains from our currency hedging program, offset by reductions in incentive compensation expense.

Interest Expense

In 2018, interest expense increased $67.2 million to $132.6 million, compared to $65.4 million in 2017 primarily driven by $39.4 million of bridge loan commitment fees and $7.7 million of accrued, unpaid interest on the repurchased Senior Notes - 2007 and increased interest expense related to the public debt issued in 2018 to finance the acquisition of Frutarom. Average cost of debt was 4.3% for the 2018 period compared to 4.1% in 2017.

Other (Income) Expense, Net

Other income, net, decreased approximately $14.5 million to $35.2 million of income in 2018 versus $49.8 million of income in 2017. The decrease was largely driven by decreases in gains on foreign currency of approximately $8 million year over year as well as a decrease in pension related other net income.

Loss on extinguishment of debt

Loss on extinguishment of debt was $38.8 million in the third quarter of 2018. The loss on extinguishment of debt is driven by a $34.9 million make whole payment on the Senior Notes - 2007 and a $3.9 million realized loss on the termination of a fair value hedge.

Income Taxes

The effective tax rate was 24.1% in 2018 as compared to 44.9% in 2017. The year-over-year reduction principally relates to lower U.S. tax reform charges in 2018, partially offset by nondeductible Frutarom acquisition costs, an unfavorable mix of earnings, lower loss provisions, and a lower level of reversals of valuation allowances on U.S. state deferred taxes. Excluding $25.3 million related to the U.S. tax reform, Frutarom acquisition costs of $28.5 million, FDA mandated product recall costs of $1.6 million, integration related costs of $1.4 million, restructuring and other charges, net of $1.0 million, operational improvement initiative costs of $0.7 million, gain on sale of assets of $0.4 million and acquisition related costs of $0.3 million, the adjusted effective tax rate for 2018 was 18.4%. For 2017, the adjusted tax rate was 20.7% excluding $139.2 million related to the impact of the U.S. tax reform, legal charges/credits, net of $0.4 million, acquisition related costs of $6.5 million, gain on sale of assets of $0.1 million, operational improvement initiative costs of $0.5 million, restructuring and other charges, net of $5.5 million, FDA mandated product recall costs of $3.9 million, UK pension settlement charge of $0.5 million, tax assessment of $1.9 million, and integration related costs of $1.3 million.

U.S. Tax Reform

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the “Tax Act”) that significantly revised the U.S. tax code effective January 1, 2018 by, among other things, lowering the corporate income tax rate from a top marginal rate of 35% to a flat 21% and establishing a modified territorial system requiring a mandatory deemed repatriation tax on undistributed earnings of foreign subsidiaries. Beginning in 2018, the Act also requires a minimum tax on certain future earnings generated by foreign subsidiaries while providing for future tax-free repatriation of such earnings through a 100% dividends-received deduction for U.S. federal income tax purposes.

The Tax Act impacted the Company's consolidated results of operations during the 2017 fourth quarter. In particular, the transition to the new territorial tax system required the Company to record a one-time tax or “toll charge” which resulted in a provisional incremental tax expense of $100.6 million principally related to previously unremitted earnings on non-U.S. subsidiaries. The cash portion of the "toll charge" is payable in installments over 8 years beginning in 2018. In addition, the reduction of the U.S. corporate tax rate resulted in a provisional net deferred tax expense of $38.6 million related to the remeasurement of net deferred tax assets as a result of the reduction in the corporate income tax rate.

During the first quarter of 2018, the Company recorded an additional charge of $0.6 million to adjust an accrual related to withholding taxes on planned repatriations. During the second quarter of 2018, the Company paid the first installment of the “toll charge”. During the third quarter of 2018, the Company recorded a benefit of $8.0 million to adjust the provisional “toll charge” required from the transition to the new territorial tax system, and a benefit of $0.2 million to adjust the remeasurement of net deferred tax assets as a result of U.S. tax reform. During the fourth quarter, the Company completed its final assessment under SAB 118, and recorded an additional charge of $32.8 million to adjust an accrual related to the U.S. state impact and foreign withholding taxes on planned repatriations. The charge in the fourth quarter of 2018 is consistent with the Company's need to repatriate funds for debt repayment purposes.

2017 IN COMPARISON TO 2016

Sales

Sales for 2017 totaled $3.4 billion, an increase of 9% from the prior year on both a reported and currency neutral basis. Sales growth reflected new win performance (net of losses) and the effects of acquisitions in both Taste and Scent. On both a reported and currency neutral basis, the effect of acquisitions was approximately 5% to net sales amounts.

Sales performance by segment was as follows:

	% Change in Sales — 2017 vs. 2016	
	Reported	Currency Neutral(1)
Taste	9%	10%
Scent	9%	9%
Total	9%	9%

(1) Currency neutral sales growth is calculated by translating prior year sales at the exchange rates for the corresponding 2018 period.

Taste

Taste sales in 2017 increased 9% on a reported basis and 10% on a currency neutral basis versus the prior year period. Acquisitions accounted for approximately 5% of the net sales growth on both a reported and currency neutral basis. Overall growth was primarily driven by new win performance (net of losses) and the impact of acquisitions, partially offset by decreases in volume. Globally, Taste growth included mid single-digit growth in emerging markets. Overall, emerging markets represented approximately 49% of total Taste sales.

Sales growth in Taste was led by NOAM followed by EAME, LA and GA, all primarily driven by new win performance (net of losses).

Scent

Scent sales in 2017 increased 9% on both a reported basis and currency neutral basis. Acquisitions accounted for approximately 5% of both reported and currency neutral sales growth. Year-over-year, 2017 sales performance was led by new win performance (net of losses) and the impact of acquisitions, partially offset by decreases in price. Globally, Scent growth included low single-digit growth in emerging markets. Overall, emerging markets represented 47% of total Scent's sales.

Sales growth in Scent was led by Ingredients, primarily driven by price increases (principally due to increases in raw material input costs), followed by growth in Fragrance Compounds, primarily driven by new wins (net of losses) partially offset by volume reductions on existing business.

Cost of Goods Sold

Cost of goods sold, as a percentage of sales, increased 146 bps, to 56.7% in 2017 compared to 55.2% in 2016. Included in cost of goods sold was $15.9 million of acquisition-related inventory "step-up" costs, $11.0 million related to an FDA mandated product recall, $1.8 million of costs associated with operational improvement initiatives, and $0.5 million of integration related costs, in 2017. For 2016, included in costs of goods sold was $7.6 million of acquisition-related inventory "step-up" costs, $2.4 million of costs associated with operational improvement initiatives and $0.7 million of costs related to accelerated depreciation.

Research and Development (R&D)

R&D expenses, as a percentage of sales, remained relatively consistent with the prior year period at 8.7% in 2017 compared to 8.3% in 2016. The slight increase in 2017 was principally driven by recent acquisitions, and, to a lesser extent, incentive compensation.

Selling and Administrative (S&A)

S&A, as a percentage of sales, decreased 160 bps to 16.8% versus 18.4% (or 16.3% and 16.6% on an adjusted basis in 2017 and 2016, respectively). Included in 2017 were commercial real estate tax assessment charges of $5.3 million, acquisition and integration related costs of $4.5 million and $3.3 million, respectively, UK pension settlement charge of $1.9 million and net legal charges/credits, principally related to a litigation accrual of $1.0 million, compared to net legal charges/credits, principally related to a litigation accrual of $48.5 million, acquisition related costs of $4.5 million and severance costs related to the termination of a former executive officer of $1.4 million in 2016. During 2017, costs were higher as a result of recently acquired companies, offset by slightly lower legal and professional fees associated with various finance initiatives, and decreases in legal and patent fees.

Restructuring and Other Charges

Restructuring and other charges primarily consist of separation costs for employees, including severance, outplacement and other benefit costs.

(DOLLARS IN THOUSANDS)	For the Year Ended December 31, 2017	2016
Taste	$4,505	$(1,119)
Scent	13,077	(581)
Global	2,129	—
Total	$19,711	$(1,700)

Amortization of Acquisition-Related Intangibles

Amortization expenses increased to $34.7 million in 2017 compared to $23.8 million in 2016. The increase of $10.9 million is principally due to the acquisitions of Fragrance Resources and PowderPure in 2017, as well as recognizing a full year of amortization in 2017 from the acquisition of David Michael as compared to 2016.

Operating Results by Business Unit

We evaluate the performance of business units based on segment profit which is defined as operating profit before Restructuring and certain non-recurring items, Interest expense, Other expense, net and Taxes on income. See Note 15 to our Consolidated Financial Statements for the reconciliation to Income before taxes.

(DOLLARS IN THOUSANDS)	For the Year Ended December 31, 2017	2016
Segment profit:		
Taste	$360,483	$330,221
Scent	318,954	326,705
Global expenses	(60,810)	(48,352)
Operational Improvement Initiatives	(1,802)	(2,402)
Acquisition Related Costs	(20,389)	(12,195)
Integration Related Costs	(4,179)	—
Legal Charges/Credits, net	(1,000)	(48,518)
Tax Assessment	(5,331)	—
Restructuring and Other Charges, net	(19,711)	(322)
Gain on Sale of Assets	184	7,818
FDA Mandated Product Recall	(11,000)	—
UK Pension Settlement Charges	(2,769)	—
Operating Profit	$552,630	$552,955
Profit margin		
Taste	22.1 %	22.1 %
Scent	18.1 %	20.2 %
Consolidated	16.3 %	17.7 %

Taste Business Unit

Taste segment profit increased $30.3 million to $360.5 million in 2017 (22.1% of segment sales) from $330.2 million (22.1% of sales) in the comparable 2016 period. The increase in segment profit and profit margin principally reflected productivity initiatives and solid top-line growth.

Scent Business Unit

Scent segment profit decreased $7.8 million to $319.0 million in 2017 (18.1% of segment sales), compared to $326.7 million (20.2% of sales) reported in 2016. The decrease in segment profit and profit margin was principally driven by the impact of acquisitions and unfavorable price versus input costs, partially offset by volume growth and the benefits from cost and productivity initiatives.

Global Expenses

Global expenses represent corporate and headquarter-related expenses which include legal, finance, human resources and R&D and other administrative expenses that are not allocated to an individual business unit. In 2017, Global expenses were $60.8 million compared to $48.4 million during 2016. The increase was principally driven by lower gains on our cash flow hedging program and higher incentive compensation costs.

Interest Expense

In 2017, interest expense increased $12.4 million to $65.4 million, compared to $53.0 million in 2016 reflecting the impact of our issuance of Senior Notes - 2017 in the second quarter of 2017. Average cost of debt was 4.1% for the 2017 period compared to 3.8% in 2016.

Other (Income) Expense, Net

Other income, net increased approximately $26.0 million to $49.8 million of income in 2017 versus $23.8 million of income in 2016. The increase was largely driven by gains on foreign currency of approximately $13 million in the current year versus approximately $5 million in the prior year, as well as proceeds from certain life insurance policies of approximately $4 million in 2017.

Income Taxes

The effective tax rate was 44.9% in 2017 as compared to 22.7% in 2016. Excluding $139.2 million related to the U.S. tax reform, legal charges/credits, net of $0.4 million, acquisition related costs of $6.5 million, gain on sale of assets of $0.1 million, operational improvement initiative costs of $0.5 million, restructuring and other charges, net of $5.5 million, FDA mandated product recall costs of $3.9 million, UK pension settlement charge of $0.5 million, tax assessment of $1.9 million, and integration related costs of $1.3 million, the adjusted effective tax rate for 2017 was 20.7%. For 2016, the adjusted tax rate was 23.8% excluding $17.1 million, $4.1 million, $0.6 million and $0.1 million of tax benefits associated with pretax legal charges/credits, acquisition-related costs, operational improvement initiatives and restructuring related costs, respectively, as well as a $2.7 million tax charge related to the gain on sale of property. The year-over-year reduction principally reflects the reversal of certain valuation allowances on U.S. state deferred taxes.

U.S. Tax Reform

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the “Tax Act”) that significantly revised the U.S. tax code effective January 1, 2018 by, among other things, lowering the corporate income tax rate from a top marginal rate of 35% to a flat 21%, limiting deductibility of interest expense and performance based incentive compensation, transitioning to a territorial system and creating new taxes associated with global operations.

The Tax Act impacted our consolidated results of operations during the 2017 fourth quarter and is expected to continue to impact our consolidated results of operations in future periods. In particular, the transition to the new territorial tax system required us to record a one-time tax or “toll charge” which resulted in a provisional incremental tax expense of $100.6 million principally related to previously unremitted earnings on non-U.S. subsidiaries. The cash portion of the "toll charge" will be payable in installments over 8 years beginning in 2018. In addition, the reduction of the U.S. corporate tax rate resulted in a provisional net deferred tax expense of $38.6 million related to the remeasurement of net deferred tax assets as a result of the reduction in the corporate income tax rate. Given the significant complexity of the Tax Act, anticipated guidance from the U.S. Treasury about implementing the Tax Act and the potential for additional guidance from the SEC or the FASB, the Company’s provisional charge may be adjusted during 2018 and is expected to be finalized no later than the fourth quarter of 2018. Other provisions of the Tax Act that impact future tax years are still being assessed. Any material revisions in the Company's computations could adversely affect its cash flows and results of operations.

Based on our current assessment and understanding of the Tax Act and the Company's current global operating structure, the Company believes its effective tax rate will be approximately 21% in 2018. The impact of the Tax Act may differ from this estimate, due to, among other things, changes in interpretations and assumptions the Company has made, additional guidance that may be issued by the taxing authorities as well as operating and/or structural changes that the Company may take as a result of the Tax Act.

Liquidity and Capital Resources

CASH AND CASH EQUIVALENTS

We had cash and cash equivalents of $634.9 million at December 31, 2018 compared to $368.0 million at December 31, 2017, of which $434.6 million of the balance at December 31, 2018 was held outside the United States. Cash balances held in foreign jurisdictions are, in most circumstances, available to be repatriated to the United States. Effective utilization of the cash generated by our international operations is a critical component of our strategy. We regularly repatriate cash from our non-U.S. subsidiaries to fund financial obligations in the U.S. These repatriations totaled $155.1 million, $192.2 million and $134.5 million in 2018, 2017, and 2016, respectively. The Tax Act includes a mandatory one-time tax on accumulated earnings of foreign subsidiaries as of December 31, 2017, and as a result, all previously unremitted earnings for which no U.S. deferred tax liability had been accrued were subject to U.S. tax and will not be subject to additional U.S. federal tax when repatriated. However, such distributions could be subject to foreign withholding or other taxes, including state taxes. We have repatriated $155.1 million during 2018 and anticipate repatriating amounts in the future to provide for the cash needs of our U.S. operations and to repay debt. We anticipate the relevant foreign withholding and other taxes, including state taxes, to be approximately $88.8 million and have recorded the deferred tax liabilities accordingly.

RESTRICTED CASH

As discussed in Note 3 to the Consolidated Financial Statements, restricted cash of $13.6 million relates to amounts escrowed related to certain payments to be made to former Frutarom option holders in future periods.

CASH FLOWS FROM OPERATING ACTIVITIES

Operating cash flows in 2018 were $437.6 million compared to $390.8 million in 2017 and $550.1 million in 2016. The increase in operating cash flows from 2017 to 2018 was principally driven by lower litigation settlement and pension payments and higher net income, offset by higher net working capital (principally related to inventories). The decrease in operating cash flows in 2017 as compared to 2016 was principally related to the impact of increased core working capital requirements (trade receivables, inventories and accounts payable) and due to payments on legal claims along with severance, integration and acquisition costs.

Working capital (current assets less current liabilities) totaled $1.81 billion at year-end 2018 compared to $1.13 billion at December 31, 2017. This increase in working capital of $685.8 million primarily reflected increases in accounts receivable and inventory offset by increases in accounts payable and other current liabilities as compared to the prior year.

We sold certain accounts receivable on a non-recourse basis to unrelated financial institutions under “factoring” agreements that are sponsored, solely and individually, by certain customers. We believe that participating in the factoring programs strengthens our relationships with these customers and provides operational efficiencies. We estimate that, as a result of participating in the programs, the beneficial impact on cash provided by operations decreased approximately $16.9 million in 2018, compared to an increase of approximately $7.6 million and $34 million in 2017 and 2016, respectively. The cost of participating in these programs was immaterial to our results in all periods.

CASH FLOWS USED IN INVESTING ACTIVITIES

Net investing activities in 2018 utilized $5.0 billion compared to $299.9 million and $355.5 million in 2017 and 2016, respectively. The increase in cash paid for investing activities was primarily driven by higher payments for acquisitions. In 2018, we acquired Frutarom for approximately $7 billion (net of cash acquired) of which $4.9 billion was paid in cash. In 2017, we acquired Fragrance Resources and PowderPure for approximately $137.5 million (net of cash acquired) and $54.2 million (net of cash acquired), respectively, in addition to a purchase price adjustment of $0.7 million related to David Michael in 2017.

Additions to property, plant and equipment were $170.1 million, $129.0 million and $126.4 million in 2018, 2017 and 2016, respectively (net of grants and other reimbursements from government authorities). These investments largely arise from our ongoing focus to align our manufacturing facilities with customer demand, primarily in emerging markets, and new technology consistent with our strategy.

In light of our requirement to begin relocating one of our Fragrance Ingredients facilities in China, the ongoing construction of new facilities in India and Indonesia, and capital requirements to integrate our recently acquired Frutarom business, we expect that capital spending in 2019 will be about 5-6% of sales (net of potential grants and other reimbursements from government authorities).

CASH FLOWS PROVIDED BY FINANCING ACTIVITIES

Net cash provided by financing activities in 2018 increased to $4,870.7 million, compared to cash used in financing activities of $42.6 million and $34.4 million in 2017 and 2016, respectively. The increase in 2018 versus 2017 was principally driven by Frutarom related financing activities where we issued $3.3 billion of debt, including €1.1 billion aggregate principal amount of the 2018 Euro Senior Notes, $1.5 billion aggregate principal amount of the 2018 USD Senior Notes, $139.5 million aggregate principal amount of the Amortizing Note portion of the TEUs and $350 million aggregate principal amount of the Term Loan, as compared to $493.9 million of 2047 Notes issued in 2017. We also issued $2.3 billion of equity in the third quarter of 2018 to finance the Frutarom acquisition, including $1.6 billion of our common stock and $685.5 million of the stock purchase contract portion ("SPC") of the TEUs. Additionally, we repaid $288.8 million of our Senior notes - 2007, including the loss on extinguishment of debt of $38.8 million.

At December 31, 2018, we had $4,553.1 million of debt outstanding compared to $1,639.2 million outstanding at December 31, 2017.

We paid dividends totaling $230.2 million, $206.1 million and $184.9 million in 2018, 2017 and 2016, respectively. The cash dividend declared per share in 2018, 2017 and 2016 was $2.84, $2.66 and $2.40, respectively.

Our capital allocation strategy is primarily focused on debt repayment to maintain our investment grade rating. We will also prioritize capital investment in our businesses to support the strategic long term plans. The company is also committed to maintaining its history of paying a dividend to investors determined by our Board of Directors (“Board”) at its discretion based on various factors, and finally will be very selective in pursuing value creating strategic M&A over the near term.

In December 2012, the Board of Directors authorized a $250.0 million share repurchase program, which commenced in the first quarter of 2013. In August 2015, the Board of Directors approved an additional $250 million share repurchase authorization and extension through December 31, 2017. Based on the total remaining amount of $279.7 million available under the amended repurchase program as of October 31, 2017, the Board of Directors re-approved on November 1, 2017 a $250.0 million share repurchase authorization and extension for a total value of $300.0 million available under the program, which expires on November 1, 2022. Based on the total remaining amount of $280 million available under the repurchase program, approximately 2.1 million shares, or 1.9% of shares outstanding (based on the market price and shares outstanding as of December 31, 2018) could be repurchased under the program as of December 31, 2018. On May 7, 2018, we announced that we were suspending our share repurchases until our deleveraging target is met following our acquisition of Frutarom.

CAPITAL RESOURCES

Operating cash flow provides the primary source of funds for capital investment needs, dividends paid to shareholders and debt service repayments. We anticipate that cash flows from operations and availability under our existing credit facilities will sufficient to meet our investing and financing needs. We regularly assess our capital structure, including both current and long-term debt instruments, as compared to our cash generation and investment needs in order to provide ample flexibility and to optimize our leverage ratios. We believe our existing cash balances are sufficient to meet our debt service requirements.

As discussed above and in Note 10 to the Consolidated Financial Statements, in connection with our acquisition of Frutarom, we repaid the $250 million outstanding principal amount of the Senior notes - 2007, plus accrued and unpaid interest of $7.7 million and a make whole payment of $34.9 million and $3.9 million realized loss on the termination of a fair value hedge, in addition to $695 million of Frutarom's net debt concurrent with the closing of the transaction. In the next three years, we expect to reduce our net debt by repaying our outstanding liabilities upon maturity using the proceeds from operating cashflows and from the suspension of our share repurchase program.

During the fourth quarter of 2018, we acquired Frutarom for approximately $7 billion (net of cash acquired). The cash portion of the consideration was approximately $5 billion, which was funded from the proceeds from issuing $3 billion in net new debt, issuing $2.3 billion in equity. We also issued of treasury shares worth $2.1 billion.

During the second quarter of 2017, we acquired PowderPure for approximately $54.2 million (net of cash acquired), which was funded from existing resources.

During the first quarter of 2017, we acquired Fragrance Resources for approximately $137.5 million (net of cash acquired), which was funded from existing resources.

During the fourth quarter of 2016, we acquired David Michael for approximately $237.5 million (net of cash acquired), which was funded from existing resources.

Credit Facility and Senior Notes

We supplement short-term liquidity with access to capital markets, mainly through bank credit facilities and issuance of commercial paper.

Commercial Paper

Commercial paper issued by the Company generally has terms of 90 days or less. As of December 31, 2018 and 2017, there was no commercial paper outstanding. The revolving credit facility is used as a backstop for the Company's commercial paper program. The maximum amount of commercial paper outstanding during 2018 and 2017 was $85 million and $107.5 million, respectively.

Credit Facility and Term Loan

On May 21, 2018, June 6, 2018 and July 13, 2018, the Company and certain of its subsidiaries amended and restated the Company’s existing amended and restated credit agreement with Citibank, N.A., as administrative agent (as amended, the “Amended Credit Facility”) in connection with the acquisition of Frutarom, to, among other things (i) extend the maturity date of the Amended Credit Facility until June 6, 2023, (ii) increase the maximum ratio of net debt to EBITDA on and after the closing date of the acquisition and (iii) increase the drawn down capacity to $1,000 million, consisting of a $585 million tranche A revolving credit facility (which provides for borrowings available in U.S. dollars, euros, Swiss francs, Japanese yen and/or British pounds sterling, with a sublimit of $25 million for swing line borrowings) (“Tranche A”) and a $415 million tranche B revolving credit facility (which provides for borrowings available in U.S. dollars, euros, Swiss francs, Japanese yen and/or British pounds sterling, with sublimits of €50 million and $25 million for swing line borrowings) (“Tranche B” and, together with Tranche A, the “Revolving Facility”). The interest rate on the Revolving Facility will be, at the applicable borrower’s option, a per annum rate equal to either (x) an adjusted LIBOR rate plus an applicable margin varying from 0.75% to 1.75% or (y) a base rate plus an applicable margin varying from 0.00% to 0.750%, in each case depending on the public debt ratings for non-credit enhanced long-term senior unsecured debt issued by the Company. Other terms and covenants under the Amended Credit Facility remain substantially unchanged. The Amended Credit Facility is available for general corporate purposes of each borrower and its subsidiaries. The obligations under the Amended Credit Facility are unsecured and the Company has guaranteed the obligations of each other borrower under the Amended Credit Facility. The Company pays a commitment fee on the aggregate unused commitments; such fee is not material.

On June 6, 2018, the Company entered into a term loan credit agreement to replace a portion of the bridge loan facility, reducing the amount of the bridge loan commitments by $350 million. Under the term loan credit agreement, the lenders thereunder committed to provide, subject to certain conditions, a senior unsecured term loan facility (as amended, "Term Loan") in an original aggregate principal amount of up to $350.0 million, maturing three years after the funding date thereunder. The proceeds from the term loan were received on October 3, 2018.

The Term Loan bears interest, at the Company’s option, at a per annum rate equal to either (x) an adjusted LIBOR rate plus an applicable margin varying from 0.75% to 2.00% or (y) a base rate plus an applicable margin varying from 0.00% to 1.00%, in each case depending on the public debt ratings for non-credit enhanced long-term senior unsecured debt issued by the Company. Loans under the Term Loan will amortize quarterly at a per annum rate of 10.0% of the aggregate principal amount of the loans made under the Term Loan on the funding date, commencing December 31, 2018, with the balance payable on October 3, 2021. The Company may voluntarily prepay the term loans without premium or penalty.

The Amended Credit Facility and Term Loan contain various covenants, limitations and events of default customary for similar facilities for similarly rated borrowers, including the requirement for us to maintain, at the end of each fiscal quarter, a ratio of net debt for borrowed money to adjusted EBITDA in respect of the previous 12-month period, including the pro forma effect of the acquisition of Frutarom, of not more than 4.5 to 1.0, which shall be reduced to 4.25 to 1.0 as of the end of September 30, 2019, 4.0 to 1.0 as of the end of March 31, 2020 and to 3.5 to 1.0 as of the end of March 31, 2021.

As of December 31, 2018 we had no of borrowings under our Amended Credit Facility but $350 million outstanding for the Term Loan. The amount which we are able to draw down on under the Amended Credit Facility is limited by financial covenants as described in more detail below. As of December 31, 2018, our draw down capacity was $1 billion on the Amended Credit Facility and $350 million on the Term Loan. See Note 10 to the Consolidated Financial Statements for further information on the credit facility and loan.

At December 31, 2018 and 2017 we were in compliance with all financial and other covenants, including the net debt to adjusted EBITDA ratio. At December 31, 2018 our Net Debt/adjusted EBITDA[1] ratio was 3.56 to 1 as defined by the credit facility agreements, well below the financial covenants of existing outstanding debt. Failure to comply with the financial and other covenants under our debt agreements would constitute default and would allow the lenders to accelerate the maturity of all indebtedness under the related agreement. If such acceleration were to occur, we would not have sufficient liquidity available to repay the indebtedness. We would likely have to seek amendments under the agreements for relief from the financial covenants or repay the debt with proceeds from the issuance of new debt or equity, and/or asset sales, if necessary. We may be unable to amend the agreements or raise sufficient capital to repay such obligations in the event the maturities are accelerated.

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(1) Adjusted EBITDA and Net Debt, which are non-GAAP measures used for these covenants, are calculated in accordance with the definition in the debt agreements. In this context, these measures are used solely to provide information on the extent to which we are in compliance with debt covenants and may not be comparable to adjusted EBITDA and Net Debt used by other companies. Reconciliations of adjusted EBITDA to net income and net debt to total debt are as follows:

(DOLLARS IN MILLIONS)	Year Ended December 31, 2018
Net income	$ 432.0
Interest expense	148.4
Income taxes	140.2
Depreciation and amortization	226.8
Specified items[1]	123.4
Non-cash items[2]	29.6
Adjusted EBITDA	$ 1,100.4

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(1) Specified items for the 12 months ended December 31, 2018 of $123.4 million consist of acquisition related costs, operational improvement initiatives, integration related costs, restructuring and other charges, net, FDA mandated product recall, and Frutarom acquisition related costs.

(2) Non-cash items represent all other adjustments to reconcile net income to net cash provided by operations as presented on the Statement of Cash Flows, including stock-based compensation and gain on sale of assets.

(DOLLARS IN MILLIONS)	December 31, 2018
Total debt	$ 4,553.1
Adjustments:	
Cash and cash equivalents	(634.9)
Net debt	$ 3,918.2

Senior Notes

2047 Notes. On May 18, 2017, we issued $500.0 million face amount of 4.375% Senior Notes ("2047 Notes") due 2047 at a discount of $1.8 million. We received proceeds related to the issuance of these 2047 Notes of $493.9 million which was net of the $1.8 million discount and $4.4 million in underwriting fees (recorded as deferred financing costs). In addition, we incurred $0.9 million in legal and professional costs associated with the issuance and such costs were recorded as deferred financing costs. In connection with the debt issuance, we entered into pre-issuance hedging transactions that were settled upon issuance of the debt and resulted in a loss of approximately $5.3 million. The 2047 Notes bear interest at a rate of 4.375% per annum, with interest payable semi-annually on June 1 and December 1 of each year, commencing on December 1, 2017. The 2047 Notes will mature on June 1, 2047. See Note 10 to the Consolidated Financial Statements for further information on the 2047 Senior Notes.

2024 Euro Notes. On March 14, 2016, we issued €500.0 million face amount of 1.75% Senior Notes ("2024 Euro Notes") due 2024 at a discount of €0.9 million. We received proceeds related to the issuance of these 2024 Euro Notes of €496.0 million which was net of the €0.9 million discount and €3.1 million underwriting discount (recorded as deferred financing costs). The 2024 Euro Notes bear interest at a rate of 1.75% per annum, with interest payable on March 14 of each year, commencing on March 14, 2017. The 2024 Euro Notes will mature on March 14, 2024. See Note 10 to the Consolidated Financial Statements for further information on the 2024 Euro Notes.

2023 Notes. On April 4, 2013, we issued $300.0 million face amount of 3.20% Senior Notes (“2023 Notes”) due 2023 at a discount of $0.3 million. We received proceeds related to the issuance of these 2023 Notes of $297.8 million which was net of the $0.3 million discount and a $1.9 million underwriting discount (recorded as deferred financing costs). In addition, we incurred $0.9 million of other deferred financing costs in connection with the debt issuance. The discount and deferred financing costs are being amortized as interest expense over the term of the 2023 Notes. The 2023 Notes bear interest at a rate of 3.20% per year, with interest payable on May 1 and November 1 of each year, commencing on November 1, 2013. The 2023 Notes mature on May 1, 2023. See Note 10 to the Consolidated Financial Statements for further information on the 2023 Notes.

Senior Notes - 2007. In September 2007, we issued an aggregate of $500.0 million of senior unsecured notes in four series, with $250.0 million due in 2017, $100.0 million due in 2019, $50 million due in 2022 and $100.0 million due in 2027. During the third quarter of 2017, the $250.0 million series note matured and was repaid in full. See Note 10 to the Consolidated Financial Statements for further information on the Senior Notes - 2007.

Financing of the Acquisition of Frutarom

Bridge Loan Facility

In connection with entering into the merger agreement with Frutarom in May 2018, the Company entered into a debt commitment letter for up to a $5.45 billion 364-day unsecured bridge loan facility to the extent the Company had not received $5.45 billion of net cash proceeds (and/or qualified bank commitments) from a combination of (a) the issuance by the Company of a combination of equity securities, equity-linked securities and/or unsecured debt securities and/or (b) unsecured term loans, in each case, at or prior to completion of the acquisition. On May 21, 2018, the Company, Morgan Stanley Senior Funding, Inc. and certain other financial institutions entered into a bridge joinder agreement to the commitment letter to provide for additional bridge commitment parties. As a result of the Company's entering into the debt and equity financing as discussed above, the bridge loan facility was terminated on September 26, 2018. In connection with the bridge loan commitment, the Company incurred $39.4 million of fees which are included in Interest expense in the Consolidated Statement of Income and Comprehensive Income in the year ended December 31, 2018.

Senior Unsecured Notes

On September 25, 2018 the Company issued €300.0 million aggregate principal amount of senior unsecured notes that mature on September 25, 2021 (the “2021 Euro Notes”). The 2021 Notes bear interest at a rate of 0.5% per year, payable annually on September 25 of each year, beginning September 25, 2019. Total proceeds from the issuance of the 2021 Notes, net of underwriting discounts and offering costs, were €297.7 million ($349.5 million in USD).

On September 25, 2018, the Company issued €800.0 million aggregate principal amount of senior unsecured notes that mature on September 25, 2026 (the “2026 Euro Notes”). The 2026 Notes bear interest at a rate of 1.8% per year, payable annually on September 25 of each year, beginning September 25, 2019. Total proceeds from the issuance of the 2026 Notes, net of underwriting discounts and offering costs, were €794.1 million ($932.2 million in USD).

On September 26, 2018, the Company issued $300.0 million aggregate principal amount of senior unsecured notes that mature on September 25, 2020 (the “2020 Notes”). The 2020 Notes bear interest at a rate of 3.4% per year, payable semi-annually on March 25 and September 25 of each year, beginning March 25, 2019. Total proceeds from the issuance of the 2020 Notes, net of underwriting discounts and offering costs, were $298.9 million.

On September 26, 2018, the Company issued $400.0 million aggregate principal amount of senior unsecured notes that mature on September 26, 2028 (the “2028 Notes”). The 2028 Notes bear interest at a rate of 4.45% per year, payable semi-annually on March 26 and September 26 of each year, beginning March 26, 2019. Total proceeds from the issuance of the 2028 Notes, net of underwriting discounts and offering costs, were $397.0 million.

On September 26, 2018, the Company issued $800.0 million aggregate principal amount of senior unsecured notes that mature on September 26, 2048 (the “2048 Notes” and collectively with the 2021 Euro Notes, 2026 Euro Notes, 2020 Notes, 2028 Notes, the "2018 Senior Unsecured Notes"). The 2048 Notes bear interest at a rate of 5.0% per year, payable semi-annually on March 26 and September 26 of each year, beginning March 26, 2019. Total proceeds from the issuance of the 2048 Notes, net of underwriting discounts and offering costs, were $787.2 million.

Tangible Equity Units - Senior Unsecured Amortizing Notes

On September 17, 2018, in connection with the issuance of the TEUs, the Company issued $139.5 million aggregate principal amount of Amortizing Notes. The Amortizing Notes mature on September 15, 2021. Each quarterly cash installment payment of $0.75 (or, in the case of the installment payment due on December 15, 2018, $0.73333) per Amortizing Note will constitute a partial repayment of principal and a payment of interest, computed at an annual rate of 3.79%. Interest will be calculated on the basis of a 360 day year consisting of twelve 30 day months. Payments will be applied first to the interest due and payable and then to the reduction of the unpaid principal amount, allocated as set forth in the amortization schedule in the indenture governing the Amortizing Notes. See Note 9 for further information on the TEUs.

There are no covenants or provisions in the indenture related to the TEUs that would afford the holders of the amortizing notes protection in the event of a highly leveraged transaction, reorganization, restructuring, merger or similar transaction involving the Company that may adversely affect such holders. If a fundamental change occurs, or if the Company elects to settle the SPCs early, then the holders of the Amortizing Notes will have the right to require the Company to repurchase the Amortizing Notes at a repurchase price equal to the principal amount of the Amortizing Notes as of the repurchase date plus accrued and unpaid interest. The indenture also contains customary events of default which would permit the holders of the Amortizing Notes to declare the notes to be immediately due and payable if not cured within applicable grace periods, including the failure to make timely installment payments on the notes or other material indebtedness, failure to give notice of a fundamental change and specified events of bankruptcy and insolvency.

Other Commitments

Compliance with existing governmental requirements regulating the discharge of materials into the environment has not materially affected our operations, earnings or competitive position. In 2018 and 2017, we spent $6.2 million and $27.9 million on capital projects and $21.7 million and $17.5 million, respectively, in operating expenses and governmental charges for the purpose of complying with such regulations. Expenditures for these purposes will continue for the foreseeable future. In addition, we are party to a number of proceedings brought under the Comprehensive Environmental Response, Compensation and Liability Act or similar state statutes. It is expected that the impact of any judgments in or voluntary settlements of such proceedings will not be material to our financial condition, results of operations or liquidity.

CONTRACTUAL OBLIGATIONS

At December 31, 2018, we had contractual payment obligations due within the time periods as specified in the following table:

	Payments Due				
	Total	Less than 1 Year	1-3 Years	3-5 Years	After 5 Years
(Dollars In Millions)		2019	2020 - 2021	2022 - 2023	2024 and thereafter
Borrowings[1]	$4,595	$45	$1,074	$ 300	$ 3,176
Interest on borrowings[1]	2,273	144	268	226	1,635
Operating leases[2]	390	49	79	61	201
Pension funding obligations[3]	70	23	47	—	—
Postretirement obligations[4]	60	4	8	8	40
Purchase commitments[5]	136	126	10	—	—
U.S. tax reform toll-charge[6]	53	5	9	13	26
Total	$7,577	$396	$1,495	$ 608	$ 5,078

(1) See Note 10 to the Consolidated Financial Statements for a further discussion of our various borrowing facilities.

(2)

Operating leases include facility and other lease commitments executed in the normal course of the business, including sale leaseback obligations included in Note 8 of the Notes to the Consolidated Financial Statements. Further details concerning worldwide aggregate operating leases are contained in Note 18 of the Notes to the Consolidated Financial Statements.

See Note 16 of the Notes to the Consolidated Financial Statements for a further discussion of our retirement plans.

(3) Anticipated funding obligations are based on current actuarial assumptions. The projected contributions beyond fiscal year 2021 are not currently determinable.

(4) Amounts represent expected future benefit payments for our postretirement benefit plans.

(5) Purchase commitments include agreements for raw material procurement and contractual capital expenditures. Amounts for purchase commitments represent only those items which are based on agreements that are enforceable and legally binding.

(6) This amount represents the cash portion of the "toll charge" that is payable in installments over eight years beginning in 2018. This amount represents the seven remaining installments.

The table above does not include $48.9 million of the total unrecognized tax benefits for uncertain tax positions and approximately $3 million of associated accrued interest, and $88.8 million associated with the deferred tax liability on deemed repatriation. Due to the high degree of uncertainty regarding the timing of potential cash flows, we are unable to make a reasonable estimate of the amount and period in which the remaining liabilities might be paid.

Critical Accounting Policies and Use of Estimates

Our significant accounting policies are more fully described in Note 1 to the Consolidated Financial Statements. As disclosed in Note 1, the preparation of financial statements in conformity with U.S. generally accepted accounting principles ("GAAP") requires management to make estimates and assumptions that affect reported amounts and accompanying disclosures. These estimates are based on management's best judgment of current events and actions that we may undertake in the future. Actual results may ultimately differ from these estimates.

Those areas requiring the greatest degree of management judgment or deemed most critical to our financial reporting involve:

Business Combinations. From time to time we enter into strategic acquisitions in an effort to better service existing customers and to attain new customers. When we acquire a controlling financial interest in an entity or group of assets that are determined to meet the definition of a business, we apply the acquisition method described in ASC Topic 805, Business Combinations. In accordance with GAAP, the results of the acquisitions we have completed are reflected in our financial statements from the date of acquisition forward.

We allocate the purchase consideration paid to acquire the business to the assets acquired and liabilities assumed based on estimated fair values at the acquisition date, with the excess of purchase price over the estimated fair value of the net assets acquired recorded as goodwill. If during the measurement period (a period not to exceed twelve months from the acquisition date) we receive additional information that existed as of the acquisition date but at the time of the original allocation described above was unknown to us, we make the appropriate adjustments to the purchase price allocation in the reporting period the amounts are determined.

Significant judgment is required to estimate the intangibles and fair value of fixed assets and in assigning their respective useful lives. Accordingly, we typically engage third-party valuation specialists, who work under the direction of management, to assist in valuing significant tangible and intangible assets acquired.

The fair value estimates are based on available historical information, future expectations and assumptions deemed reasonable by management, but are inherently uncertain.

We typically use an income method to estimate the fair value of intangible assets, which is based on forecasts of the expected future cash flows attributable to the respective assets. Significant estimates and assumptions inherent in the valuations reflect a consideration of other marketplace participants, and include the amount and timing of future cash flows (including expected growth rates, discount rate and profitability), royalty rates used in the relief of royalty method, customer attrition rates, product obsolescence factors, a brand's relative market position and the discount rate applied to the cash flows. Unanticipated market or macroeconomic events and circumstances may occur, which could affect the accuracy or validity of the estimates and assumptions.

Determining the useful life of an intangible asset also requires significant judgment. All of our acquired intangible assets (e.g., trademarks, product formulas, non-compete agreements and customer relationships) are expected to have finite useful lives. Our estimates of the useful lives of finite-lived intangible assets are based on a number of factors including competitive environment, market share, brand history, operating plans and the macroeconomic environment of the regions in which the brands are sold.

The costs of finite-lived intangible assets are amortized through expense over their estimated lives. The value of residual goodwill is not amortized, but is tested at least annually for impairment as described in the following note.

For acquired intangible assets, the remaining useful life of the trade names and trademarks, product formulas, and customer relationships was estimated at the point at which substantially all of the present value of cumulative cash flows have been earned.

The periodic assessment of potential impairment of goodwill. We currently have goodwill of $5.4 billion, of which $4.2 billion relates to our acquisition of Frutarom and is subject to change upon completion of our allocation of the consideration transferred to the assets acquired and liabilities assumed from Frutarom. The allocation of goodwill among reporting units has not yet been completed but will be completed within one year from the Frutarom acquisition date, October 4, 2018.

In assessing the potential for impairment of goodwill, management uses the most current actual and forecasted operating data available and current market-based assumptions in accordance with the criteria in Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") 350. The Company has identified five reporting units: (1) Flavor Compounds, (2) Fragrance Compounds, (3) Fragrance Ingredients, (4) Cosmetic Actives Ingredients and (5) Frutarom. These reporting units were determined based on the level at which the performance is measured and reviewed by segment management. In the case of Frutarom, the reporting unit determination is preliminary and is subject to change.

The Company performs an annual goodwill impairment test for its reporting units by assessing the fair value of the reporting units based on discounted cash flows. If a reporting unit's carrying amount exceeds its fair value, the Company will record an impairment charge based on that difference, and the impairment charge will be limited to the amount of goodwill allocated to that reporting unit. The Company completed its annual goodwill impairment test as of November 30, 2018, which indicated no impairment of goodwill as the estimated fair values substantially exceeded the carrying values of each of these reporting units, except for the recently acquired Frutarom reporting unit for which the fair value is expected to approximate the carrying value.

The periodic assessment of potential impairment of finite-lived intangible assets. The Company reviews long-lived assets for impairment when events or changes in business conditions indicate that their full carrying value may not be recovered. An estimate of undiscounted future cash flows produced by an asset or group of assets is compared to the carrying value to determine whether impairment exists. If assets are determined to be impaired, the loss is measured based on an estimate of fair value using various valuation techniques, including a discounted estimate of future cash flows.

The analysis and evaluation of income taxes. We account for taxes under the asset and liability method. Under this method, deferred income taxes are recognized for temporary differences between the financial statement and tax return bases of assets and liabilities. A valuation allowance is recognized if, based on the weight of available evidence, it is more likely than not that some portion or all of the deferred tax asset will not be realized. The assessment of the need for a valuation allowance requires management to make estimates and assumptions about future earnings, reversal of existing temporary differences and available tax planning strategies. If actual experience differs from these estimates and assumptions, the recorded deferred tax asset may not be fully realized resulting in an increase to income tax expense in our results of operations.

We are subject to income taxes in the U.S. and numerous foreign jurisdictions. Significant judgment is required in evaluating our uncertain tax positions and determining our provision for income taxes. We first determine whether it is "more likely than not" that we would sustain our tax position if the relevant tax authority were to audit the position with full knowledge of all the relevant facts and other information. For those tax positions that meet this threshold, we measure the amount of tax benefit based on the largest amount of tax benefit that we have a greater than 50% chance of realizing in a final settlement with the relevant authority. Those tax positions failing to qualify for initial recognition are recognized in the first interim period in which they meet the more likely than not standard. This evaluation is made at the time that we adopt a tax position and whenever there is new information and is based upon management's evaluation of the facts, circumstances and information available at the reporting date. We maintain a cumulative risk portfolio relating to all of our uncertainties in income taxes in order to perform this analysis, but the evaluation of our tax positions requires significant judgment and estimation in part because, in certain cases, tax law is subject to varied interpretation, and whether a tax position will ultimately be sustained may be uncertain. We do not currently believe that any of our pending tax assessments, even if ultimately resolved against us, would have a material impact on our results of operations and cash flows.

On December 22, 2017, the U.S. government enacted comprehensive tax legislation commonly referred to as the Tax Cuts and Jobs Act (the "Tax Act") that significantly revised the U.S. tax code effective January 1, 2018 by, among other things, lowering the corporate income tax rate from a top marginal rate of 35% to a flat 21%, limiting deductibility of interest expense and performance based incentive compensation, transitioning to a territorial system and creating new taxes associated with global operations.

The Tax Act impacted our consolidated results of operations during the 2017 fourth quarter. In particular, the transition to the new territorial tax system required us to record a one-time tax or "toll charge" which resulted in a provisional incremental tax expense of $100.6 million principally related to previously unremitted earnings on non-U.S. subsidiaries. The cash portion of the "toll charge" is payable in installments over 8 years beginning in 2018. In addition, the reduction of the U.S. corporate tax rate resulted in a provisional net deferred tax expense of $38.6 million related to the remeasurement of net deferred tax assets as a result of the reduction in the corporate income tax rate.

During the first quarter of 2018, the Company recorded an additional charge of $0.6 million to adjust an accrual related to withholding taxes on planned repatriations. During the second quarter of 2018, the Company paid the first installment of the “toll charge”. During the third quarter of 2018, the Company recorded a benefit of $8.0 million to adjust the provisional “toll charge” required from the transition to the new territorial tax system, and a benefit of $0.2 million to adjust the remeasurement of net deferred tax assets as a result of U.S. tax reform. During the fourth quarter, the Company recorded an additional charge of $32.8 million to adjust an accrual related to the U.S. state impact and foreign withholding taxes on planned repatriations, and completed its assessment under SAB 118 with no further material change to the amounts previously recorded.

The Tax Act created significant international tax provisions, including a new category of income, global intangible low-taxed income (GILTI). The Company has elected to treat GILTI as a current period cost if and when incurred. This tax position resulted in an $8.2 million income tax expense for the year ended December 31, 2018.

The evaluation of potential litigation and environmental liabilities, where changing circumstances, rules and regulations require regular reassessment of related practices and anticipated costs. We are subject to certain legal claims regarding products and other matters, as well as environmental-related matters. Significant management judgment is involved in determining when it is probable that a liability has been incurred and the extent to which it can be reasonably estimated.

We regularly assess potential liabilities with respect to all legal claims based on the most recent available information, in consultation with outside counsel we have engaged on our behalf to handle the defense of such matters. To the extent a liability is considered to be probable and reasonably estimable, we recognize a corresponding liability; if the reasonably estimated liability is a range, we recognize that amount considered most likely, or in the absence of such a determination, the minimum reasonably estimated liability. To the extent such claims are covered by various insurance policies, we separately evaluate the right to recovery and estimate the related insurance claim receivable. Management judgments involve determination as to whether a liability has been incurred, the reasonably estimated amount of that liability, and any potential insurance recovery.

We regularly evaluate potential environmental exposure in terms of total estimated cost and the viability of other potentially responsible parties (“PRP’s”) associated with our exposure. Recorded liabilities are adjusted periodically as remediation efforts progress and additional information becomes available. Critical management assumptions relate to expected total costs to remediate and the financial viability of PRP’s to share such costs.

Determination of the various assumptions employed in the valuation of pension and retiree health care expense and associated obligations. Amounts recognized in the Consolidated Financial Statements related to pension and other postretirement benefits are determined from actuarial valuations. Inherent in such valuations are assumptions including expected return on plan assets, discount rates at which the liabilities could be settled, rates of increase in future compensation levels, mortality rates and health care cost trend rates. These assumptions are updated annually and are disclosed in Note 16 to the Consolidated Financial Statements. In accordance with GAAP, actual results that differ from the assumptions are accumulated and amortized over future periods and, therefore, affect expense recognized and obligations recorded in future periods.

We consider a number of factors in determining and selecting assumptions for the overall expected long-term rate of return on plan assets. We consider the historical long-term return experience of our assets, the current and expected allocation of our plan assets, and expected long-term rates of return. We derive these expected long-term rates of return with the assistance of our investment advisors. We base our expected allocation of plan assets on a diversified portfolio consisting of domestic and international equity securities, fixed income, real estate, and alternative asset classes.

We consider a variety of factors in determining and selecting our assumptions for the discount rate at December 31. For the U.S. plans, the discount rate was based on the internal rate of return for a portfolio of high quality bonds rated Aa or higher by either Moody’s or Standard & Poor's with maturities that are consistent with the projected future benefit payment obligations of the plan. For the Non-U.S. Plans, the discount rates were determined by region and are based on high quality long-term corporate bonds. Consideration has been given to the duration of the liabilities in each plan when selecting the bonds to be used in determining the discount rate. The rate of compensation increase for all plans and the medical cost trend rate for the applicable U.S. plans are based on plan experience.

With respect to the U.S. plans, the expected rate of return on plan assets was determined based on an asset allocation model using the current target allocation, real rates of return by asset class and an anticipated inflation rate. The target asset allocation consists of approximately: 20% in equity securities and 80% in fixed income securities. The plan has achieved a compounded annual rate of return of 4.9% over the previous 20 years. At December 31, 2018, the actual asset allocation for the U.S. plan was: 1% cash and cash equivalents, 25% in equity securities and 74% in fixed income securities.

The expected rate of return for the non-U.S. plans employs a similar set of criteria adapted for local investments, inflation rates and in certain cases specific government requirements. The target asset allocation, for the non-U.S. plans, consists of approximately: 40% – 70% in fixed income securities; 15% – 40% in equity securities; 5% – 20% in real estate; and 5% – 10% in alternative investments. At December 31, 2018, the actual asset allocation for the non-U.S. plan was: 36% in fixed income investments; 12% in equity investments; 8% in real estate investments, 3% in cash and cash equivalents and 41% in alternative investments.

Changes in pension and other post-employment benefits, and associated expenses, may occur in the future due to changes in these assumptions. The impact that a 0.25% decrease in the discount rate or a 1% change in the medical cost trend rate would have on our pension and other post-employment benefit expense, as applicable, is as follows:

	Sensitivity of Disclosures to Changes in Selected Assumptions			
	25 BP Decrease in Discount Rate		25 BP Decrease in Discount Rate	25 BP Decrease in Long-Term Rate of Return
(DOLLARS IN THOUSANDS)	Change in PBO	Change in ABO	Change in pension expense	Change in pension expense
U.S. Pension Plans	$14,603	$ 14,524	$ (102)	$ 1,248
Non-U.S. Pension Plans	46,475	44,628	2,710	1,911
Postretirement Benefit Plan	N/A	1,638	44	N/A

The effect of a 1% increase in the medical cost trend rate would increase the accumulated postretirement benefit obligation and the annual postretirement expense by approximately $0.3 million and less than $0.1 million, respectively; a 1% decrease in the rate would decrease the obligation and expense by approximately $0.3 million and less than $0.1 million, respectively.

The ongoing assessment of the valuation of inventory, given the large number of natural ingredients employed, the quality of which may be diminished over time. We hold a majority of our inventory as raw materials, providing the greatest degree of flexibility in manufacture and use. As of December 31, 2018, we maintained 53% of our inventory as raw materials. Materials are evaluated based on shelf life, known uses and anticipated demand based on forecasted customer order activity and changes in product/sales mix. Management policy provides for an ongoing assessment of inventory with adjustments recorded when an item is deemed to be slow moving or obsolete.

Redeemable Non-controlling interest. Through some of our subsidiaries, we assume certain non-controlling interests that carry redemption features. Non-controlling interests, where we may be required to repurchase the non-controlling interest under a put option or other contractual redemption requirement, are reported in the Consolidated Balance Sheet between liabilities and equity, as redeemable non-controlling interest. We adjust the redeemable non-controlling interests when the redemption value exceeds the carrying value with changes recognized as an adjustment to additional paid-in capital.

Overall, we believe that we have considered relevant circumstances that we may be currently subject to, and the financial statements accurately reflect our best estimate of the impact of these items in our results of operations, financial condition and cash flows for the years presented. We have discussed the decision process and selection of these critical accounting policies with the Audit Committee of the Board of Directors.

New Accounting Standards

Please refer to Note 1 to the Consolidated Financial Statements for a discussion of recent accounting pronouncements.

Revenue Recognition - Adoption of ASC 606

In May 2014, the FASB issued ASU 2014-09, "Revenue from Contracts with Customers", with subsequent amendments, that provides for a comprehensive model to be used in accounting for revenue arising from contracts with customers (ASC Topic 606, Revenue from Contracts with Customers) (the “Revenue Standard”). Under the Revenue Standard, revenue is recognized to reflect the transfer of goods or services to customers in an amount that reflects the consideration to which we expect to be entitled in exchange for those goods or services. Companies have the option to apply the new guidance under a retrospective approach to each prior reporting period presented or a modified retrospective approach with the cumulative effect of initially applying the new guidance recognized at the date of initial application within the Consolidated Balance Sheet. The new Revenue Standard became effective for annual reporting periods beginning after December 15, 2017, and we have adopted the new revenue standard using the modified retrospective approach on December 30, 2017, the first day of our 2018 fiscal year.

We create and manufacture flavors and fragrances. Approximately 90% of our products, principally flavor compounds and fragrance compounds, are customized to customer specifications and have no alternative use other than the sale to the specific customer (“Compounds products”). The remaining revenue is derived largely from ingredients products that, generally, are commodity products with alternative uses and not customized (“Ingredients products”).

With respect to the vast majority of our contracts for Compounds products, we currently recognize revenue on the transfer of control of the product at a point in time as we do not have an “enforceable right to payment for performance to date" (as set out in the Revenue Standard). With respect to a small number of contracts for the sale of Compounds, we have an "enforceable right to payment for performance to date" and as the products do not have an alternative use, we recognize revenue for these contracts over time and record a contract asset using the output method. The output method recognizes revenue on the basis of direct measurements of the value to the customer of the goods or services transferred to date relative to the remaining goods or services promised under the contract.

With respect to our contracts related to Ingredients products, we currently recognize revenue on the transfer of control of the product at a point in time as such products generally have alternative uses and we do not have an "enforceable right to payment for performance to date."

As we adopted the Revenue Standard using the modified retrospective method effective the first day of its 2018 fiscal year, results for our 2018 fiscal year are presented under the Revenue Standard while prior period amounts are not adjusted and continue to be reported in accordance with our historic accounting under ASC Topic 605, which required that revenue was accounted for when the earnings process was complete.

We recorded a net increase to retained earnings of $2.1 million as of the first day of its 2018 fiscal year due to the cumulative impact of adopting the Revenue Standard. In connection with the adjustment to retained earnings, we also recorded an increase of $4.4 million in contract assets (which are included in Prepaid expenses and other assets), a decrease of $1.7 million in inventory, and an increase in taxes payable of $0.6 million.

The impact to revenues, gross profit and net income for the twelve months ended December 31, 2018 were reductions of $4.0 million, $2.6 million and $1.9 million, respectively, as a result of applying the Revenue Standard as compared to the amounts that would have been recognized under ASC Topic 605.

Revenue Recognition

We recognize revenue when control of the promised goods is transferred to its customers in an amount that reflects the consideration it expects to be entitled to in exchange for those goods. Sales, value add, and other taxes we collect are excluded from revenues. We receive payment in accordance with standard customer terms.

The following table presents our revenues disaggregated by product categories:

	December 31,		
(DOLLARS IN THOUSANDS)	2018	2017[(a)]	2016(a)
Flavor Compounds	$1,990,985	$1,632,166	$1,496,525
Fragrance Compounds	1,496,493	1,424,612	1,303,653
Ingredients	490,061	341,941	316,172
Total revenues	$3,977,539	$3,398,719	$3,116,350

(a) Prior period amounts have not been adjusted based on the modified retrospective method.

The following table presents our revenues disaggregated by region, based on the region of our customers:

	December 31,		
(DOLLARS IN THOUSANDS)	2018	2017[(a)]	2016[(a)]
Europe, Africa and Middle East	$1,396,315	$1,065,596	$964,931
Greater Asia	991,015	903,546	880,040
North America	1,010,126	901,821	769,081
Latin America	580,083	527,756	502,298
Total revenues	$3,977,539	$3,398,719	$3,116,350

(a) Prior period amounts have not been adjusted based on the modified retrospective method.

Flavor and Fragrance Compounds Revenues

We account for a contract when it has approval and commitment from both parties, the rights of the parties and payment terms (which vary by customer) are identified, the contract has commercial substance, and collectability of consideration is probable. Consistent with our past practice, the amount of revenue recognized is adjusted at the time of sale for expected discounts and rebates (“Variable Consideration”).

We generate revenues primarily by manufacturing customized taste and scent compounds for the exclusive use of our customers. We combine the shipment of goods with their manufacture to account for both shipment and manufacture as the sole performance obligation.

With respect to the vast majority of our contracts for Compounds products, we recognize a sale at the point in time when it ships the product from its manufacturing facility to its customer, as this is the time when control of the goods has transferred to the customer. The amount of consideration received and revenue recognized is impacted by the Variable Consideration the Company has agreed with its customers. We estimate Variable Consideration amounts for each customer based on the specific agreement, an analysis of historical volumes and the current activity with that customer. We reassess our estimates of Variable Consideration at each reporting date throughout the contract period and updates the estimate until the uncertainty is resolved. During the current period, changes to estimates of Variable Consideration have been immaterial.

With respect to a small number of contracts for the sale of Compounds products, we recognize revenue over time as it manufactures customized compounds that do not have an alternative use and for which the contracts provide us with an enforceable right to payment, including a reasonable profit, at all times during the contract term commencing with the manufacturing of the goods. When revenue is recognized over time, the amount of revenue recognized is based on the extent of progress towards completion of the promised goods. We generally use the output method to measure progress for its contracts as this method reflects the transfer of goods to the customer. Once customization begins, the manufacturing process is generally completed within a two week period. Due to the short time frame for production, there is little estimation uncertainty in the process. In addition, due to the customized nature of our products, our returns are not material.

Ingredients Revenues

We account for a contract when it has approval and commitment from both parties, the rights of the parties and payment terms (which vary by customer) are identified, the contract has commercial substance, and collectability of consideration is probable.

We generate revenues primarily by manufacturing Ingredients products for the use of our customers. We combine the shipment of goods with their manufacture to account for both shipment and manufacture as the sole performance obligation.

Generally, we recognize a sale at the time when it ships the product from their manufacturing facility to their customer, as this is the point when control of the goods or services has transferred to the customer. The amount of consideration received and revenue recognized is impacted by discounts offered to its customers. We estimate discounts based on an analysis of historical experience and current activity. We assess our estimates of discounts at each reporting date throughout the contract period and updates its estimates until the uncertainty has been resolved. During the current period, changes to estimates of discounts have been immaterial.

Contract Asset and Accounts Receivable

The following table reflects the balances in our contract assets and accounts receivable for the twelve months ended December 31, 2018 and 2017:

	December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
Receivables (included in Trade receivables)	946,938	677,055
Contract asset - Short term	487	4,499

Non-GAAP Financial Measures

We use non-GAAP financial operating measures in this Form 10-K, including: (i) currency neutral sales (which eliminates the effects that result from translating its international sales in U.S. dollars), (ii) adjusted gross profit and adjusted gross margin (which exclude operational improvement initiatives, acquisition related costs, integration related costs, FDA mandated product recall and Frutarom acquisition related costs), (iii) adjusted operating profit and adjusted operating margin (which excludes operational improvement initiatives, acquisition related costs, integration related costs, legal charges/credits, net, tax assessment, restructuring and other charges, net, gain on sale of assets, FDA mandated product recall, UK pension settlement charges and Frutarom acquisition related costs), and (iv) adjusted selling and administrative expenses (which excludes acquisition related costs, integration related costs, legal charges/credits, net, tax assessment, UK pension settlement charges and Frutarom acquisition related costs) and (v) adjusted effective tax rate (which excludes operational improvement initiatives, acquisition related costs, integration related costs, legal charges/credits, net, tax assessment, restructuring and other charges, net, CTA realization, FDA mandated product recall, UK pension settlement charges, U.S. tax reform and Frutarom acquisition related costs). We also provide the non-GAAP measures adjusted EBITDA (which excludes certain specified items and non-cash items as set forth in the Company's debt agreements) and net debt (which is adjusted for deferred gain on interest rate swaps and cash and cash equivalents) solely for the purpose of providing information on the extent to which the Company is in compliance with debt covenants contained in its debt agreements.

In addition, the Frutarom acquisition related costs have been separated from costs related to prior acquisitions. The Frutarom acquisition costs represent a significant balance and we believe this amount should be shown separately to provide an accurate presentation of the acquisition related costs. Our GAAP results and GAAP metrics do not change and this change has no effect on day to day business operations, or how we manage our business.

We have included each of these non-GAAP measures in order to provide additional information regarding our underlying operating results and comparable year-over-year performance. Such information is supplemental to information presented in accordance with GAAP and is not intended to represent a presentation in accordance with GAAP. In discussing our historical and expected future results and financial condition, we believe it is meaningful for investors to be made aware of and to be assisted in a better understanding of, on a period-to-period comparable basis, financial amounts both including and excluding these identified items, as well as the impact of exchange rate fluctuations. We believe such additional non-GAAP information provides investors with an overall perspective of the period-to-period performance of our business. In addition, management internally reviews each of these non-GAAP measures to evaluate performance on a comparative period-to-period basis in terms of absolute performance, trends and expected future performance with respect to our business. A material limitation of these non-GAAP measures is that such measures do not reflect actual GAAP amounts. We compensate for such limitations by using these measures as one of several metrics, including GAAP measures. These non-GAAP measures may not be comparable to similarly titled measures used by other companies.

A. Reconciliation of Non-GAAP Metrics

Reconciliation of Gross Profit

	Year Ended December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
Reported (GAAP)	$1,682,707	$1,472,463
Operational Improvement Initiatives (a)	1,650	1,802
Acquisition Related Costs (b)	—	15,860
Integration Related Costs (c)	102	480
FDA Mandated Product Recall (h)	(7,125)	11,000
Frutarom Acquisition Related Costs (k)	23,550	—
Adjusted (Non-GAAP)	$1,700,884	$1,501,605

Reconciliation of Selling and Administrative Expenses

	Year Ended December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
Reported (GAAP)	$707,461	$570,144
Acquisition Related Costs (b)	1,289	(4,529)
Integration Related Costs (c)	(6,060)	(3,258)
Legal Charges/Credits, net (d)	—	(1,000)
Tax Assessment (e)	—	(5,331)
UK Pension Settlement Charges (i)	—	(1,882)
Frutarom Acquisition Related Costs (k)	(66,082)	—
Adjusted (Non-GAAP)	$636,608	$554,144

Reconciliation of Operating Profit

	Year Ended December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
Reported (GAAP)	$583,882	$552,630
Operational Improvement Initiatives (a)	2,169	1,802
Acquisition Related Costs (b)	(1,289)	20,389
Integration Related Costs (c)	7,188	4,179
Legal Charges/Credits, net (d)	—	1,000
Tax Assessment (e)	—	5,331
Restructuring and Other Charges, net (f)	4,086	19,711
Gain on Sale of Assets	(1,177)	(184)
FDA Mandated Product Recall (h)	(7,125)	11,000
UK Pension Settlement Charges (i)	—	2,769
Frutarom Acquisition Related Costs (k)	89,632	—
Adjusted (Non-GAAP)	$677,366	$618,627

Reconciliation of Net Income and EPS

	Year Ended December 31, 2018				2017			
(DOLLARS IN THOUSANDS)	Income before taxes	Taxes on income (m)	Net Income Attribut-able to IFF (n)	Diluted EPS (o)	Income before taxes	Taxes on income (m)	Net Income Attribut-able to IFF	Diluted EPS
Reported (GAAP)	$447,757	$107,976	$337,302	$3.79	$537,045	$241,380	$295,665	$3.72
Operational Improvement Initiatives (a)	2,169	694	1,475	0.02	1,802	450	1,352	0.02
Acquisition Related Costs (b)	(1,289)	(311)	(978)	(0.01)	20,389	6,514	13,875	0.17
Integration Related Costs (c)	7,188	1,397	5,791	0.07	4,179	1,331	2,848	0.03
Legal Charges/Credits, net (d)	—	—	—	—	1,000	354	646	0.01
Tax Assessment (e)	—	—	—	—	5,331	1,885	3,446	0.04
Restructuring and Other Charges, net (f)	4,086	1,020	3,066	0.03	19,711	5,465	14,246	0.17
Gains on Sale of Assets	(1,177)	(352)	(825)	(0.01)	(184)	(59)	(125)	—
CTA Realization (g)	—	—	—	—	(12,217)	—	(12,217)	(0.15)
FDA Mandated Product Recall (h)	(7,125)	(1,601)	(5,524)	(0.06)	11,000	3,890	7,110	0.09
UK Pension Settlement Charges (i)	—	—	—	—	2,769	526	2,243	0.03
U.S. Tax Reform (j)	—	(25,345)	25,345	0.29	—	(139,172)	139,172	1.76
Frutarom Acquisition Related Costs (k)	155,569	28,490	127,079	1.44	—	—	—	—
Redemption value adjustment to EPS (l)	—	—	—	0.03	—	—	—	—
Adjusted (Non-GAAP)	$607,178	$111,968	$492,731	$5.58	$590,825	$122,564	$468,261	$5.89

(a) For 2018, represents accelerated depreciation related to a plant relocation in India and Taiwan asset write off. For 2017, represents accelerated depreciation and idle labor costs in Hangzhou, China.

(b) For 2018, represents adjustments to the contingent consideration payable for PowderPure, and transaction costs related to Fragrance Resources and PowderPure within Selling and administrative expenses. For 2017, represents the amortization of inventory "step-up" included in Cost of goods sold and transaction costs related to the acquisitions of Fragrance Resources and PowderPure within Selling and administrative expenses.

(c) For 2018, represents costs related to the integration of the Frutarom acquisition. For 2017, represents costs related to the integration of the David Michael and Fragrance Resources acquisitions.

(d) Represents additional charge related to litigation settlement.

(e) Represents the reserve for payment of a tax assessment related to commercial rent for prior periods.

(f) For 2018, represents severance costs related to the 2017 Productivity Program and costs associated with the termination of agent relationships in a subsidiary. For 2017, represents severance costs related to the 2017 Productivity Program.

(g) Represents the release of CTA related to the liquidation of a foreign entity.

(h) For 2018, principally represents recoveries from the supplier for the third and fourth quarter, partially offset by final payments to the customer made for the effected product in the first quarter. For 2017, represents management's best estimate of losses related to the previously disclosed FDA mandated recall.

(i)	Represents pension settlement charges incurred in one of the Company's UK pension plans.
(j)	For 2017, represents charges incurred related to enactment of certain U.S. tax legislation changes in December 2017, including $38.6 million related to net adjustments on deferred tax assets, and $100.6 million related to taxes on deemed repatriation of earnings. For 2018, represents additional expense based on updated repatriation plans requiring accruals for withholding taxes on deemed repatriation.
(k)	Represents transaction-related costs and expenses related to the acquisition of Frutarom. Amount primarily includes $23.5 million of amortization for inventory "step-up" costs, $39.4 million of bridge loan commitment fees included in Interest expense; $34.9 million make whole payment on the Senior Notes - 2007 and $3.9 million realized loss on a fair value hedge included in Loss on extinguishment of debt; $12.5 million realized gain on a foreign currency derivative included in Other income; and $66.0 million of transaction costs included in Selling and administrative expenses.
(l)	Represents the adjustment to EPS related to the excess of the redemption value of certain redeemable noncontrolling interests over their existing carrying value.

(m) Except for amortization, the income tax expense (benefit) on non-GAAP adjustments is computed in accordance with ASC 740 using the same methodology as the GAAP provision of income taxes. Income tax effects of non-GAAP adjustments are calculated based on the applicable statutory tax rate for each jurisdiction in which such charges were incurred, except for those items which are non-taxable for which the tax expense (benefit) was calculated at 0%. For fiscal year 2018, these non-GAAP adjustments were not subject to foreign tax credits or valuation allowances, but to the extent that such factors are applicable to any future non-GAAP adjustments we will take such factors into consideration in calculating the tax expense (benefit). For amortization, the tax benefit has been calculated based on the Company's adjusted worldwide effective tax rate.

(n) For 2018, net income is reduced by income attributable to noncontrolling interest of $2.5M.

(o) The sum of these items does not foot due to rounding.

B. Foreign Currency Reconciliation

Operating Profit

	Year Ended December 31,	
	2018	2017
% Change - Reported (GAAP)	6%	2%
Items impacting comparability [1]	4%	2%
% Change - Adjusted (Non-GAAP)	10%	4%
Currency Impact	(3)%	1%
% Change Year-over-Year - Currency Neutral Adjusted (Non-GAAP)**	7%	5%

[1] Includes items impacting comparability of $93.5 million for the year ended December 31, 2018 and includes $66.0 million of items impacting comparability for the year ended December 31, 2017.

** Currency neutral amount is calculated by translating prior year amounts at the exchange rates used for the corresponding 2018 period. Currency neutral operating profit also eliminates the year-over-year impact of cash flow hedging.

Cautionary Statement Under the Private Securities Litigation Reform Act of 1995

Statements in this Form 10-K, which are not historical facts or information, are “forward-looking statements” within the meaning of The Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on management’s current assumptions, estimates and expectations and include statements concerning (i) our ability to achieve the anticipated benefits of the Frutarom acquisition, including our ability to capitalize on future growth opportunities and offer our customers innovative and differentiated products and our ability to achieve the cost-savings synergies; (ii) our ability to achieve long-term sustainable growth and increase shareholder value, (ii) the growth potential of the markets in which we operate, including the emerging markets, (iii) our expectations regarding our Ingredients business, (iv) our expectations regarding percentage of revenues that will be attributed to research and development in 2019; (v) expected developments in the regulatory regime in which we operate; (vi) our expectations regarding future price volatility of raw materials; (vi) our expectations regarding the impact of litigation; (vii) expected capital expenditures and cost pressures in 2019, (viii) expectations regarding our 2017 productivity program; (ix) our ability to innovate and execute on specific consumer trends and demands, and (x) our ability to reduce our net debt levels over the next three years. These forward-looking statements should be evaluated with consideration given to the many risks and uncertainties inherent in our business that could cause actual results and events to differ materially from those in the forward-looking statements. Certain of such forward-looking information may be identified by such terms as “expect”, “anticipate”, “believe”, “intend”, “outlook”, “may”, “estimate”, “should”, “predict” and s terms or variations thereof. Such forward-looking statements are based on a series of expectations, assumptions, estimates and projections about the Company, are not guarantees of future results or performance, and involve significant risks, uncertainties and other factors, including assumptions and projections, for all forward periods. Our actual results may differ materially from any future results expressed or implied by such forward-looking statements.

Such factors include, among others, the following:

- risks related to the integration of the Frutarom business, including whether we will realize the benefits anticipated from the acquisition in the expected time frame;
- unanticipated costs, liabilities, charges or expenses resulting from the Frutarom acquisition;
- the increase in our leverage resulting from the additional debt incurred to pay a portion of the consideration for Frutarom and its impact on our liquidity and ability to return capital to its shareholders;
- our ability to successfully market to its expanded and decentralized Taste and Frutarom customer base;
- our ability to effectively compete in its market and develop and introduce new products that meet customers’ needs;

- our ability to successfully develop innovative and cost-effective products that allow customers to achieve their own profitability expectations;
- the impact of the disruption in our manufacturing operations;
- the impact of a disruption in our supply chain, including the inability to obtain ingredients and raw materials from third parties;
- volatility and increases in the price of raw materials, energy and transportation;
- our ability to comply with, and the costs associated with compliance with, regulatory requirements and industry standards, including regarding product safety, quality, efficacy and environmental impact;
- the impact of any failure or interruption of our key information technology systems or a breach of information security;
- our ability to react in a timely and cost-effective manner to changes in consumer preferences and demands;
- our ability to establish and manage collaborations, joint ventures or partnership that lead to development or commercialization of products;
- our ability to benefit from its investments and expansion in emerging markets;
- the impact of currency fluctuations or devaluations in the principal foreign markets in which it operates;
- economic, regulatory and political risks associated with our international operations;
- the impact of global economic uncertainty on demand for consumer products;
- the inability to retain key personnel;
- our ability to comply with, and the costs associated with compliance with, U.S. and foreign environmental protection laws;
- our ability to realize the benefits of its cost and productivity initiatives;
- our ability to successfully manage its working capital and inventory balances;
- the impact of the failure to comply with U.S. or foreign anti-corruption and anti-bribery laws and regulations, including the U.S. Foreign Corrupt Practices Act;
- our ability to protect its intellectual property rights;
- the impact of the outcome of legal claims, regulatory investigations and litigation;
- changes in market conditions or governmental regulations relating to our pension and postretirement obligations;
- the impact of future impairment of our tangible or intangible long-lived assets;
- the impact of changes in federal, state, local and international tax legislation or policies, including the recently enacted Tax Cuts and Jobs Act, with respect to transfer pricing and state aid, and adverse results of tax audits, assessments, or disputes;
- the effect of potential government regulation on certain product development initiatives, and restrictions or costs that may be imposed on the Company or its operations as a result; and
- the impact of the United Kingdom's expected departure from the European Union in 2019.

The foregoing list of important factors does not include all such factors, nor necessarily present them in order of importance. In addition, you should consult other disclosures made by the Company (such as in our other filings with the Securities and Exchange Commission ("SEC") or in company press releases) for other factors that may cause actual results to differ materially from those projected by the Company. Please refer to Part I. Item 1A., Risk Factors, of this Form 10-K for additional information regarding factors that could affect the Company's results of operations, financial condition and liquidity.

We intend our forward-looking statements to speak only as of the time of such statements and do not undertake or plan to update or revise them as more information becomes available or to reflect changes in expectations, assumptions or results. We can give no assurance that such expectations or forward-looking statements will prove to be correct. An occurrence of, or any material adverse change in, one or more of the risk factors or risks and uncertainties referred to in this report or included in our other periodic reports filed with the SEC could materially and adversely impact our operations and our future financial results.

Any public statements or disclosures made by us following this report that modify or impact any of the forward-looking statements contained in or accompanying this report will be deemed to modify or supersede such outlook or other forward-looking statements in or accompanying this report.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

We operate on a global basis and are exposed to currency fluctuation related to the manufacture and sale of our products in currencies other than the U.S. dollar. The major foreign currencies involve the markets in the European Union, Great Britain, Mexico, Brazil, China, India, Indonesia, Australia and Japan, although all regions are subject to foreign currency fluctuations versus the U.S. dollar. We actively monitor our foreign currency exposures in all major markets in which we operate, and employ a variety of techniques to mitigate the impact of exchange rate fluctuations, including foreign currency hedging activities.

We have established a centralized reporting system to evaluate the effects of changes in interest rates, currency exchange rates and other relevant market risks. Our risk management procedures include the monitoring of interest rate and foreign exchange exposures and hedge positions utilizing statistical analyses of cash flows, market value and sensitivity analysis. However, the use of these techniques to quantify the market risk of such instruments should not be construed as an endorsement of their accuracy or the accuracy of the related assumptions. For the year ended December 31, 2018, the Company's exposure to market risk was estimated using sensitivity analyses, which illustrate the change in the fair value of a derivative financial instrument assuming hypothetical changes in foreign exchange rates and interest rates.

We enter into foreign currency forward contracts with the objective of reducing exposure to cash flow volatility associated with foreign currency receivables and payables, and with anticipated purchases of certain raw materials used in operations. These contracts, the counterparties to which are major international financial institutions, generally involve the exchange of one currency for a second currency at a future date, and have maturities not exceeding twelve months. The gain or loss on the hedging instrument and services is recorded in earnings at the same time as the transaction being hedged is recorded in earnings. At December 31, 2018, the Company's foreign currency exposures pertaining to derivative contracts exist with the Euro, Japanese Yen, British Pound, Australian Dollar and Indonesian Rupiah. Based on a hypothetical decrease or increase of 10% in the applicable balance sheet exchange rates (primarily against the U.S. dollar), the estimated fair value of the Company's foreign currency forward contracts would increase or decrease by approximately $60 million. However, any change in the value of the contracts, real or hypothetical, would be significantly offset by a corresponding change in the value of the underlying hedged items.

We use derivative instruments as part of our interest rate risk management strategy. We have entered into certain cross currency swap agreements in order to mitigate a portion of our net European investments from foreign currency risk. As of December 31, 2018, these swaps were in a net asset position with an aggregate fair value of $1.09 million. Based on a hypothetical decrease or increase of 10% in the value of the U.S. dollar against the Euro, the estimated fair value of the Company's cross currency swaps would change by approximately $60 million.

At December 31, 2018, the fair value of our EUR fixed rate debt was €1.62 billion. Based on a hypothetical increase of 10% in foreign exchange rates, the estimated fair value of the Company's EUR fixed debt would increase by $200 million.

At December 31, 2018, the fair value of our USD fixed rate debt was $2.35 billion. Based on a hypothetical increase of 10% in interest rates, the estimated fair value of the Company's US fixed debt would decrease by $84 million.

We purchase certain commodities, such as natural gas, electricity, petroleum based products and certain crop related items. We generally purchase these commodities based upon market prices that are established with the vendor as part of the purchase process. In general, we do not use commodity financial instruments to hedge commodity prices.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA.

See index to Consolidated Financial Statements on page 68. See Item 6 on page 30 for supplemental quarterly data.

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

None.

ITEM 9A. CONTROLS AND PROCEDURES.
Evaluation of Disclosure Controls and Procedures and Changes in Internal Control over Financial Reporting.
Our Chief Executive Officer and Chief Financial Officer, with the assistance of other members of our management, have evaluated the effectiveness of our disclosure controls and procedures as of the end of the period covered by this Form 10-K. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that our disclosure controls and procedures are effective as of the end of the period covered by this Form 10-K.
We have established controls and procedures designed to ensure that information required to be disclosed in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Commission's rules and forms and is accumulated and communicated to management, including the principal executive officer and the principal financial officer, to allow timely decisions regarding required disclosure.
Changes in Internal Control Over Financial Reporting.
On October 4, 2018, we completed the acquisition of Frutarom and are in the process of incorporating Frutarom into our internal control over financial reporting structure and our evaluation of internal control over financial reporting and related disclosure controls and procedures. Our Chief Executive Officer and Chief Financial Officer have concluded that, other than working to incorporate Frutarom as mentioned above, there have not been any changes in our internal control over financial reporting during the fourth quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.
Management's Report on Internal Control Over Financial Reporting.
Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934. Our 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.
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.
Management assessed the effectiveness of our internal control over financial reporting as of December 28, 2018. SEC guidance permits companies to exclude certain acquisitions from the assessment of internal control over financial reporting during the first year following the acquisition. Accordingly, management excluded from its assessment the internal control over financial reporting at Frutarom, which was acquired on October 4, 2018 and whose financial results constitute approximately 9% of net sales and 29% of assets of the consolidated financial statement amounts as of and for the fiscal year ended December 28, 2018.
In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in its 2013 Internal Control — Integrated Framework.
Based on this assessment, management determined that, as of December 28, 2018, our internal control over financial reporting was effective.
PricewaterhouseCoopers LLP, our independent registered public accounting firm, has audited the effectiveness of our internal control over financial reporting as of December 28, 2018 as stated in their report which is included herein.

ITEM 9B. OTHER INFORMATION.
None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

The information relating to directors and nominees of the Company is set forth in the IFF 2019 Proxy Statement and is incorporated by reference herein. The information relating to Section 16(a) beneficial ownership reporting compliance that appears in the IFF 2019 Proxy Statement is also incorporated by reference herein. See Part I, Item 1 of this Form 10-K for information relating to the Company's Executive Officers.

We have adopted a Code of Business Conduct and Ethics (the "Code of Ethics") that applies to all of our employees, including our chief executive officer and our chief financial officer (who is also our principal accounting officer). We have also adopted a Code of Conduct for Directors and a Code of Conduct for Executive Officers (together with the Code of Ethics, the "Codes"). The Codes are available through the Investors — Corporate Governance link on our website www.iff.com.

Only the Board of Directors or the Audit Committee of the Board may grant a waiver from any provision of our Codes in favor of a director or executive officer, and any such waiver will be publicly disclosed. We will disclose substantive amendments to and any waivers from the Codes provided to our chief executive officer and principal financial officer (principal accounting officer), as well as any other executive officer or director, on the Company's website: www.iff.com.

The information regarding the Company's Audit Committee and its designated audit committee financial experts is set forth in the IFF 2019 Proxy Statement and such information is incorporated by reference herein.

The information concerning procedures by which shareholders may recommend director nominees is set forth in the IFF 2019 Proxy Statement and such information is incorporated by reference herein.

ITEM 11. EXECUTIVE COMPENSATION.

The items required by Part III, Item 11 are incorporated herein by reference from the IFF 2019 Proxy Statement to be filed on or before April 30, 2019.

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

The items required by Part III, Item 12 are incorporated herein by reference from the IFF 2019 Proxy Statement to be filed on or before April 30, 2019.

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

The items required by Part III, Item 13 are incorporated herein by reference from the IFF 2019 Proxy Statement to be filed on or before April 30, 2019.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES.

The items required by Part III, Item 13 are incorporated herein by reference from the IFF 2019 Proxy Statement to be filed on or before April 30, 2019.

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES.

(a)(1) FINANCIAL STATEMENTS: The following consolidated financial statements, related notes, and independent registered public accounting firm's report are included in this Form 10-K:

(a)(2) FINANCIAL STATEMENT SCHEDULES

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

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of International Flavors & Fragrances Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of International Flavors & Fragrances Inc. and its subsidiaries (the "Company") as of December 28, 2018 and December 29, 2017, and the related consolidated statements of income and comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 28, 2018, including the related notes and schedule of valuation and qualifying accounts and reserves for each of the three years in the period ended December 28, 2018 appearing on page S-1 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 28, 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 consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 28, 2018 and December 29, 2017, and the results of their operations and their cash flows for each of the three years in the period ended December 28, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 28, 2018, based on criteria established in Internal Control - Integrated Framework (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Report on Internal Control over Financial Reporting, appearing under Item 9A. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

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

As described in Management's Report on Internal Control over Financial Reporting, management has excluded Frutarom Industries Ltd. and its subsidiaries ("Frutarom Industries Ltd.") from its assessment of internal control over financial reporting as of December 28, 2018, because it was acquired by the Company in a purchase business combination during 2018. We have also excluded Frutarom Industries Ltd. from our audit of internal control over financial reporting. Frutarom Industries Ltd. is a wholly-owned subsidiary whose total net sales and total assets excluded from management's assessment and our audit of internal control over financial reporting represent approximately 9% and 29%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 28, 2018.

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/ PricewaterhouseCoopers LLP
New York, New York
February 26, 2019

We have served as the Company's auditor since 1957.

INTERNATIONAL FLAVORS & FRAGRANCES INC.
CONSOLIDATED STATEMENT OF INCOME AND COMPREHENSIVE INCOME

	Year Ended December 31,		
(DOLLARS IN THOUSANDS EXCEPT PER SHARE AMOUNTS)	2018	2017	2016
Net sales	$3,977,539	$3,398,719	$3,116,350
Cost of goods sold	2,294,832	1,926,256	1,720,787
Gross Profit	1,682,707	1,472,463	1,395,563
Research and development expenses	311,583	295,469	258,863
Selling and administrative expenses	707,461	570,144	572,518
Restructuring and other charges, net	5,079	19,711	(1,700)
Amortization of acquisition-related intangibles	75,879	34,693	23,763
Gains on sale of assets	(1,177)	(184)	(10,836)
Operating Profit	583,882	552,630	552,955
Interest expense	132,558	65,363	52,989
Loss on extinguishment of debt	38,810	—	—
Other income, net	(35,243)	(49,778)	(23,751)
Income before taxes	447,757	537,045	523,717
Taxes on income	107,976	241,380	118,686
Net income	339,781	295,665	405,031
Net income attributable to noncontrolling interests	2,479	—	—
Net income attributable to IFF stockholders	337,302	295,665	405,031
Other comprehensive income (loss):			
Foreign currency translation adjustments	(99,580)	54,609	(54,526)
Gains (losses) on derivatives qualifying as hedges	15,078	(17,936)	(1,797)
Pension and postretirement liability adjustment	19,757	5,940	(10,332)
Comprehensive income attributable to IFF stockholders	272,557	338,278	338,376
Net income per share — basic	$3.81	$3.73	$5.07
Net income per share — diluted	$3.79	$3.72	$5.05
Average number of shares outstanding - basic	87,551	79,070	79,648
Average number of shares outstanding - diluted	88,121	79,370	79,981

See Notes to Consolidated Financial Statements
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INTERNATIONAL FLAVORS & FRAGRANCES INC.
CONSOLIDATED BALANCE SHEET

	December 31,	
(DOLLARS IN THOUSANDS)	2018	2017
ASSETS		
Current Assets:		
Cash and cash equivalents	$634,897	$368,046
Restricted cash	13,625	—
Receivables:		
Trade	946,938	677,055
Allowance for doubtful accounts	(9,173)	(13,392)
Inventories	1,078,537	649,448
Prepaid expenses and other current assets	277,036	215,387
Total Current Assets	2,941,860	1,896,544
Property, plant and equipment, net	1,241,152	880,580
Goodwill	5,378,388	1,156,288
Other intangible assets, net	3,039,322	415,787
Other assets	288,673	249,727
Total Assets	$12,889,395	$4,598,926
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current Liabilities:		
Bank borrowings, overdrafts and current portion of long-term debt	$48,642	$6,966
Accounts payable	471,382	338,188
Dividends payable	77,779	54,420
Other current liabilities	530,508	369,194
Total Current Liabilities	1,128,311	768,768
Other Liabilities:		
Long-term debt	4,504,417	1,632,186
Deferred gains	31,366	37,344
Retirement liabilities	227,172	228,936
Deferred income taxes	655,879	51,104
Other liabilities	217,070	191,294
Total Other Liabilities	5,635,904	2,140,864
Commitments and Contingencies (Note 20)		
Redeemable non-controlling interests	81,806	—
Shareholders' Equity:		
Common stock 12 1/2¢ par value; 500,000,000 shares authorized; 128,526,137 and 115,858,190 shares issued as of December 31, 2018 and December 31, 2017, respectively; and 106,619,202 and 78,947,381 shares outstanding as of December 31, 2018 and December 31, 2017, respectively	16,066	14,470
Capital in excess of par value	3,793,609	162,827
Retained earnings	3,956,221	3,870,621
Accumulated other comprehensive loss:		
Cumulative translation adjustments	(396,996)	(297,416)
Accumulated gains (losses) on derivatives qualifying as hedges	4,746	(10,332)
Pension and postretirement liability adjustment	(309,977)	(329,734)
Treasury stock, at cost (21,906,935 and 36,910,809 shares as of December 31, 2018 and December 31, 2017, respectively)	(1,030,718)	(1,726,234)
Total Shareholders' Equity	6,032,951	1,684,202

Noncontrolling interests	10,423	5,092
Total Shareholders’ Equity including noncontrolling interests	6,043,374	1,689,294
Total Liabilities and Shareholders’ Equity	$12,889,395	$4,598,926

See Notes to Consolidated Financial Statements

INTERNATIONAL FLAVORS & FRAGRANCES INC.
CONSOLIDATED STATEMENT OF CASH FLOWS

	Year Ended December 31,		
(DOLLARS IN THOUSANDS)	2018	2017	2016
Cash flows from operating activities:			
Net income	$339,781	$295,665	$405,031
Adjustments to reconcile to net cash provided by operating activities:			
Depreciation and amortization	173,792	117,967	102,469
Deferred income taxes	19,402	58,889	14,350
Gains on sale of assets	(1,177)	(184)	(10,836)
Stock-based compensation	29,401	26,567	24,587
Loss on extinguishment of debt	38,810	—	—
Gain on deal contingent derivatives	(12,505)	—	—
Pension contributions	(22,433)	(39,298)	(46,347)
Litigation settlement	—	(56,000)	—
Product recall claim settlement, net of insurance proceeds received	235	—	—
Foreign currency gain on liquidation of entity	—	(12,217)	—
Changes in assets and liabilities, net of acquisitions:			
Trade receivables	(49,958)	(68,851)	(21,544)
Inventories	(117,641)	(18,911)	15,452
Accounts payable	55,136	29,114	(7,642)
Accruals for incentive compensation	(2,289)	19,144	12,133
Other current payables and accrued expenses	(5,279)	22,679	49,103
Other assets	(19,219)	(3,866)	(1,067)
Other liabilities	11,519	20,058	14,450
Net cash provided by operating activities	437,575	390,756	550,139
Cash flows from investing activities:			
Cash paid for acquisitions, net of cash received	(4,857,343)	(192,328)	(236,836)
Additions to property, plant and equipment	(170,094)	(128,973)	(126,412)
Additions to intangible assets	(3,326)	—	—
Proceeds from disposal of assets	8,176	16,139	6,856
Proceeds from disposal of subsidiaries, net of cash held	10,157	—	—
Maturity of net investment hedges	(2,642)	1,434	637
Proceeds from life insurance contracts	1,837	3,798	292
Net cash used in investing activities	(5,013,235)	(299,930)	(355,463)
Cash flows from financing activities:			
Cash dividends paid to shareholders	(230,218)	(206,118)	(184,897)
Decrease in revolving credit facility and short term borrowing	(927)	(4,499)	(131,074)
Deferred financing costs	(33,668)	(5,373)	(5,788)
Repayments of debt	(376,625)	(250,000)	(125,000)
Proceeds from issuance of long-term debt	3,256,742	498,250	555,559
Proceeds from sales of equity securities, net of issuance costs	2,268,094	—	—
Gain (loss) on pre-issuance hedges	12,505	(5,310)	(3,244)
Proceeds from issuance of stock in connection with stock plans	—	329	813
Employee withholding taxes paid	(9,725)	(11,768)	(13,353)
Purchase of treasury stock	(15,475)	(58,069)	(127,443)
Net cash provided by (used in) financing activities	4,870,703	(42,558)	(34,427)
Effect of exchange rate changes on cash and cash equivalents	(14,567)	(4,214)	(18,245)
Net change in cash, cash equivalents and restricted cash	280,476	44,054	142,004

Cash, cash equivalents and restricted cash at beginning of year	368,046	323,992	181,988
Cash, cash equivalents and restricted cash at end of year	$648,522	$368,046	$323,992
Cash paid for:			
Interest, net of amounts capitalized	$117,581	$55,440	$50,576
Income taxes	116,138	107,390	107,898
Noncash investing activities:			
Accrued capital expenditures	$33,844	$37,556	$26,049
Treasury stock issued in the Frutarom acquisition	701,111	—	—

See Notes to Consolidated Financial Statements

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INTERNATIONAL FLAVORS & FRAGRANCES INC.
CONSOLIDATED STATEMENT OF SHAREHOLDERS' EQUITY

(DOLLARS IN THOUSANDS)	Common stock	Capital in excess of par value	Retained earnings	Accumulated other comprehensive (loss) income	Treasury stock Shares	Treasury stock Cost	Non-controlling interest	Total
Balance at December 31, 2015	$14,470	$140,802	$3,604,254	$(613,440)	(35,835,899)	$(1,555,769)	$ 4,672	$1,594,989
Net income			405,031				218	405,249
Cumulative translation adjustment				(54,526)				(54,526)
Losses on derivatives qualifying as hedges; net of tax $(227)				(1,797)				