

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

Form 10-K

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

For the fiscal year ended December 31, 2019

OR

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

For the transition period from to

Commission file number 001-35961



Liberty Global plc

(Exact name of Registrant as specified in its charter)

England and Wales

(State or other jurisdiction of
incorporation or organization)

98-1112770

(I.R.S. Employer
Identification No.)

Griffin House

161 Hammersmith Rd

London

United Kingdom

(Address of principal executive offices)

W6 8BS

(Zip Code)

Registrant's telephone number, including area code: +44.208.483.6449 or 303.220.6600

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Class A ordinary shares	LBTYA	Nasdaq Global Select Market
Class B ordinary shares	LBTYB	Nasdaq Global Select Market
Class C ordinary shares	LBTYK	Nasdaq Global Select Market

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

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

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

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

Indicate by check mark whether the Registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T during the preceding 12 months. Yes No

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

Large Accelerated Filer Accelerated Filer Non-Accelerated Filer Smaller Reporting Company Emerging Growth Company

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

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

State the aggregate market value of the voting and non-voting common equity held by non-affiliates, computed by reference to the price at which the common equity was last sold, or the average bid and ask price of such common equity, as of the last business day of the Registrant's most recently completed second fiscal quarter: \$18.5 billion.

The number of outstanding ordinary shares of Liberty Global plc as of January 31, 2020 was: 181,568,323 shares of class A ordinary shares, 12,151,526 shares of class B ordinary shares and 438,884,260 shares of class C ordinary shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the Registrant's 2020 Annual General Meeting of Shareholders are incorporated by reference in Part III of this Form 10-K.

LIBERTY GLOBAL PLC
2019 ANNUAL REPORT ON FORM 10-K
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PART I

Item 1. BUSINESS

Who We Are

We are Liberty Global plc (**Liberty Global**), an international broadband and television company. We are focused on building a strong convergence of fixed and mobile communication opportunities and we are constantly striving to enhance and simplify our customers' lives through quality services and products that give them the freedom to connect, converse, work and be entertained anytime, anywhere they choose.

Liberty Global has consolidated operations in six European countries serving 10.7 million customers in Europe at December 31, 2019. Our primary business operations are listed below, all of which we consolidate, with the exception of the VodafoneZiggo JV (defined below).

<u>Brand</u>	<u>Entity</u>	<u>Location</u>	<u>Ownership</u>
	Virgin Media	United Kingdom & Ireland	100.0%
	Telenet	Belgium	60.2%
	UPC Holding	Switzerland, Poland, Slovakia	100.0%
	VodafoneZiggo	Netherlands	50.0%

General Development of Business

As a result of a series of mergers that were completed on June 7, 2013, Liberty Global became the publicly-held parent company of the successors by merger of Liberty Global, Inc. (the predecessor to Liberty Global) and Virgin Media Inc. (**Virgin Media**). In the following text, the terms “we”, “our”, “our company” and “us” may refer, as the context requires, to Liberty Global (or its predecessor) or collectively to Liberty Global (or its predecessor) and its subsidiaries. Unless otherwise indicated, convenience translations into United States (**U.S.**) dollars are calculated as of December 31, 2019, and operational data, including subscriber statistics and ownership percentages, are as of December 31, 2019.

Expansion and Acquisitions

We have expanded our broadband footprint through new build projects and strategically selected acquisitions. Our new build projects consist of network extension programs pursuant to which we connect additional homes and businesses to our broadband communications network (**Network Extensions**). Our investment in Network Extensions is critical not only for our business to grow, but also for the countries and communities in which we operate. The Network Extensions, together with upgrades to our existing networks and next generation customer premises equipment, provide our customers the means to enter the gigaworld society. During 2019, through our Network Extensions, our continuing operations connected approximately 649,000 additional residential and commercial premises (excluding upgrades) to our networks, including approximately 505,000 residential and commercial premises connected by Virgin Media in the United Kingdom (**U.K.**), and Ireland. We expect to continue the Network Extensions in 2020. Depending on a variety of factors, however, including the financial and operations results of our new build programs, the Network Extensions may be continued, modified or cancelled at our discretion.

Over the past five years, we have also completed several strategic acquisitions. We made these acquisitions in order to execute on our strategy to build broadband communications and mobile businesses that have strong prospects for future growth. Our significant acquisitions include:

- On June 3, 2019, Telenet Group Holding N.V. (**Telenet**) acquired the remaining 50.0% of De Vijver Media NV (**De Vijver Media**) that it did not already own (the **De Vijver Media Acquisition**). De Vijver Media provides content production, broadcasting and advertising services in Belgium.
- On June 19, 2017, Telenet acquired Coditel Brabant sprl, operating under the brand name SFR BeLux (**SFR BeLux**), which provided broadband operations in Belgium (Brussels and Wallonia) and Luxembourg.
- On May 16, 2016, we acquired Cable & Wireless Communications Limited (**C&W**), a provider of telecommunication services, including mobile and high-speed broadband, focused in Latin America and the Caribbean. In connection with the Split-off Transaction referenced below under —*Dispositions*, we transferred C&W to Liberty Latin America Ltd. (**Liberty Latin America**).
- On February 11, 2016, Telenet acquired BASE Company N.V. (**BASE**), the third-largest mobile network operator in Belgium.
- On June 3, 2015, we acquired, together with investment funds affiliated with Searchlight Capital Partners, L.P., Choice Cable TV, a cable and broadband services provider in Puerto Rico, which was integrated into the operations of Liberty Cablevision of Puerto Rico LLC. In connection with the Split-off Transaction referenced below under —*Dispositions*, we transferred Liberty Cablevision of Puerto Rico LLC to Liberty Latin America.

For additional information on our acquisitions see note5 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K. In addition, we have completed various other smaller acquisitions in the normal course of business.

Dispositions

We have completed the following dispositions during the past five years:

- On July 31, 2019, we completed the sale of our operations in Germany, Romania, Hungary and the Czech Republic to Vodafone Group plc (**Vodafone**). The operations of Germany, Romania, Hungary and the Czech Republic are collectively referred to herein as the “**Vodafone Disposal Group**.” In connection with the sale of the Vodafone Disposal Group, we have agreed to provide certain transitional services to Vodafone for a period of up to four years. These services principally comprise network and information technology-related functions.
- On May 2, 2019, we completed the sale of our direct-to-home satellite (**DTH**) operations, which serves customers in Hungary, the Czech Republic, Slovakia and Romania (**UPC DTH**) to M7 Group (**M7**). In connection with the sale of UPC DTH, we have agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprise network and information technology-related functions.
- On July 31, 2018, we completed the sale of our Austrian operations (**UPC Austria**) to Deutsche Telekom AG (**Deutsche Telekom**). In connection with the sale of UPC Austria, we have agreed to provide certain transitional services to Deutsche Telekom for a period of up to four years. These services principally comprise network and information technology-related functions.
- On December 29, 2017, we effected the split-off of our LiLAC Group (the **Split-off Transaction**) by distributing 100% of the common shares of Liberty Latin America to holders of our then LiLAC ordinary shares. The “**LiLAC Group**” consisted of our businesses, assets and liabilities in Latin America and the Caribbean, including C&W, VTR.com SpA, a 60% interest in Liberty Cablevision of Puerto Rico LLC and related cash and cash equivalents and indebtedness. Following such distribution, the LiLAC Shares were redesignated as deferred shares (with virtually no economic rights) and subsequently canceled. In connection with the Split-off Transaction, Liberty Latin America became a separate publicly traded company.
- On December 31, 2016, our company and Vodafone contributed our respective operations in the Netherlands to VodafoneZiggo Group Holding B.V., a 50:50 joint venture (referred to herein as the **VodafoneZiggo JV**). We treat the VodafoneZiggo JV as an equity investment.

For additional information on our more recent dispositions, see note6 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K. We have also completed various other smaller dispositions in the normal course of business and as required by regulatory authorities in connection with approving certain of our acquisitions.

Equity Transactions

Pursuant to our share repurchase programs authorized by our board of directors, we have repurchased a significant amount of our shares since our inception in 2005. During 2019, our share repurchases were:

<u>Title of shares</u>	<u>Number of shares</u>	<u>Average price paid per share⁽²⁾</u>	<u>Aggregate purchase price⁽²⁾</u> <u>in millions</u>
Class A ordinary shares ⁽¹⁾	24,348,562	\$ 27.61	\$ 672.4
Class C ordinary shares ⁽¹⁾	95,395,291	\$ 26.64	\$ 2,541.3

(1) Includes repurchases made pursuant to modified Dutch auction cash tenders, including 24,002,262 shares of our class A ordinary shares at a per share price of \$27.50 and 75,420,009 shares of our class C ordinary shares at a price per share of \$27.00, for an aggregate purchase price of \$2.7 billion, including direct acquisition costs.

(2) Includes direct acquisition costs.

At December 31, 2019, the remaining amount authorized for share repurchases was \$66.4 million. In February 2020, our board of directors authorized an additional \$1.0 billion for share repurchases. For a further description of our share repurchases, see note 14 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Forward Looking Statements

Certain statements in this Annual Report constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. To the extent that statements in this Annual Report are not recitations of historical fact, such statements constitute forward-looking statements, which, by definition, involve risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statements. In particular, statements under *Item 1. Business*, *Item 1A. Risk Factors*, *Item 2. Properties*, *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* and *Item 7A. Quantitative and Qualitative Disclosures About Market Risk* may contain forward-looking statements, including statements regarding our business, product, foreign currency and finance strategies, our property and equipment additions (including with respect to Network Extensions), subscriber growth and retention rates, competitive, regulatory and economic factors, the timing and impacts of proposed transactions, the maturity of our markets, the anticipated impacts of new legislation (or changes to existing rules and regulations), anticipated changes in our revenue, costs or growth rates, our liquidity, credit risks, foreign currency risks, interest rate risks, target leverage levels, debt covenants, our future projected contractual commitments and cash flows and other information and statements that are not historical fact. Where, in any forward-looking statement, we express an expectation or belief as to future results or events, such expectation or belief is expressed in good faith and believed to have a reasonable basis, but there can be no assurance that the expectation or belief will result or be achieved or accomplished. In evaluating these statements, you should consider the risks and uncertainties discussed under *Item 1A. Risk Factors* and *Item 7A. Quantitative and Qualitative Disclosures About Market Risk*, as well as the following list of some but not all of the factors that could cause actual results or events to differ materially from anticipated results or events:

- economic and business conditions and industry trends in the countries in which we or our affiliates operate;
- the competitive environment in the industries in the countries in which we or our affiliates operate, including competitor responses to our products and services;
- fluctuations in currency exchange rates and interest rates;
- instability in global financial markets, including sovereign debt issues and related fiscal reforms;
- consumer disposable income and spending levels, including the availability and amount of individual consumer debt;
- changes in consumer television viewing and broadband usage preferences and habits;
- consumer acceptance of our existing service offerings, including our cable television, broadband internet, fixed-line telephony, mobile and business service offerings, and of new technology, programming alternatives and other products and services that we may offer in the future;
- our ability to manage rapid technological changes;

- our ability to maintain or increase the number of subscriptions to our cable television, broadband internet, fixed-line telephony and mobile service offerings and our average revenue per household;
- our ability to provide satisfactory customer service, including support for new and evolving products and services;
- our ability to maintain or increase rates to our subscribers or to pass through increased costs to our subscribers;
- the impact of our future financial performance, or market conditions generally, on the availability, terms and deployment of capital;
- changes in, or failure or inability to comply with, government regulations in the countries in which we or our affiliates operate and adverse outcomes from regulatory proceedings;
- government intervention that requires opening our broadband distribution networks to competitors, such as the obligations imposed in Belgium;
- our ability to obtain regulatory approval and shareholder approval and satisfy other conditions necessary to close acquisitions and dispositions and the impact of conditions imposed by competition and other regulatory authorities in connection with acquisitions;
- our ability to successfully acquire new businesses and, if acquired, to integrate, realize anticipated efficiencies from, and implement our business plan with respect to, the businesses we have acquired or that we expect to acquire;
- changes in laws or treaties relating to taxation, or the interpretation thereof, in the U.K., the U.S. or in other countries in which we or our affiliates operate;
- changes in laws and government regulations that may impact the availability and cost of capital and the derivative instruments that hedge certain of our financial risks;
- our ability to navigate the potential impacts on our business of the U.K.'s departure from the E.U.;
- the ability of suppliers and vendors (including our third-party wireless network providers under our mobile virtual network operator (MVNO) arrangements) to timely deliver quality products, equipment, software, services and access;
- the availability of attractive programming for our video services and the costs associated with such programming, including retransmission and copyright fees payable to public and private broadcasters;
- uncertainties inherent in the development and integration of new business lines and business strategies;
- our ability to adequately forecast and plan future network requirements, including the costs and benefits associated with the planned Network Extensions;
- the availability of capital for the acquisition and/or development of telecommunications networks and services;
- problems we may discover post-closing with the operations, including the internal controls and financial reporting process, of businesses we acquire;
- the leakage of sensitive customer data;
- the outcome of any pending or threatened litigation;
- the loss of key employees and the availability of qualified personnel;
- changes in the nature of key strategic relationships with partners and joint venturers;
- our equity capital structure; and
- events that are outside of our control, such as political unrest in international markets, terrorist attacks, malicious human acts, natural disasters, pandemics and other similar events.

The broadband distribution and mobile service industries are changing rapidly and, therefore, the forward-looking statements of expectations, plans and intent in this Annual Report are subject to a significant degree of risk. These forward-looking statements and the above-described risks, uncertainties and other factors speak only as of the date of this Annual Report, and we expressly disclaim any obligation or undertaking to disseminate any updates or revisions to any forward-looking statement contained herein, to reflect any change in our expectations with regard thereto, or any other change in events, conditions or circumstances on which any such statement is based. Readers are cautioned not to place undue reliance on any forward-looking statement.

Narrative Description of Business

We are a leading international telecommunications company with a commitment to providing our customers the “best in class” communications and entertainment services. These services are delivered to our residential and business customers over our networks and include broadband internet, video, telephony and mobile services. We deliver mobile services as a mobile network operator through Telenet and as a MVNO through third-party networks. We design our services to enable our customers to access the digital world on their own terms and at their own pace. In most of our footprint, the core of our offer is “**triple-play**”, which we use to describe bundled services of broadband internet, digital video and telephony in one subscription. We have been enhancing this offer by expanding our services to include mobile services for a “**quad-play**” or fixed-mobile convergence service in most of our markets. Available service offerings depend, in particular, on the bandwidth capacity of a particular system. In certain markets, we also offer video services through fiber-to-the-home networks.

Our continuing operations provide residential and business telecommunication services in the U.K. and Ireland through Virgin Media, Belgium through Telenet, and Switzerland, Poland and Slovakia through various wholly-owned subsidiaries that we collectively refer to as “**UPC Holding**”. In terms of video subscribers, we operate the largest cable network in each of these countries, except in Poland, where we operate the second largest cable network. We also have investments in the VodafoneZiggo JV, which operates the largest cable network in the Netherlands, and in various content businesses.

A breakdown of our revenue by major category for our consolidated reportable segments appears in note 20 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

By connecting our customers through our telecommunication services, we recognize that we are a global corporate citizen and that we play a role in addressing the environmental impacts generated through our business. By seeking to address these issues, we strengthen our company and provide strong benefits to the communities in which we operate. This includes enhancing the energy efficiency of all our operations, with a focus on energy use, carbon emissions and management of electronic waste. In 2018 alone we avoided 4,809 metric tons of carbon emissions and saved close to \$290 million through our various sustainability programs. By the end of 2018, we were 20 times more carbon efficient than our base year 2012. We are also working with our major cable partners to innovate and power the network of tomorrow through the Society of Cable Telecommunications Engineers Energy2020 initiative. Additionally, we are proud to confirm that in 2018 we refurbished 2.6 million set-top boxes and modem units, avoiding 4,213 metric tons of waste that would otherwise have ended up in a landfill. We also recognize that coding skills and other technology-based jobs of the future are essential to our industry. As a result, we have partnered with the CoderDojo Foundation, a global community of free coding clubs for children age 7-17. Our support for CoderDojo is enabling the next generation of creators, improving their long-term career prospects. We are also working with European Schoolnet to raise awareness of teachers on educational resources available for them to help address online issues teenagers are facing. These efforts are being recognized by many independent analysts. We received bronze class distinction in the Dow Jones Sustainability Index for our sustainability performance in 2019, placing third overall in our sector, while our subsidiary in Belgium, Telenet, was once again the sector leader. Corporate responsibility is a key part of who we are, and we are committed to continuing our efforts to reduce the environmental impacts of our business.

Liberty Global Statistics

The following tables present certain operating data as of December 31, 2019, with respect to the networks of our consolidated subsidiaries. The following tables reflect 100% of the data applicable to each of our subsidiaries regardless of our ownership percentage.

Consolidated Operating Data - December 31, 2019

	Homes Passed (1)	Fixed-Line Customer Relationships (2)	Total RGUs (3)	Internet Subscribers (4)	Video		Total Video	Telephony Subscribers (7)	Mobile Subscribers (8)
					Basic Video Subscribers (5)	Enhanced Video Subscribers (6)			
United Kingdom	14,894,400	5,518,100	13,563,900	5,271,000	—	3,687,400	3,687,400	4,605,500	3,179,500
Belgium	3,385,200	2,072,100	4,743,500	1,664,400	164,700	1,701,900	1,866,600	1,212,500	2,808,400
Switzerland (9)	2,372,800	1,038,800	2,179,800	661,400	418,700	593,200	1,011,900	506,500	200,700
Ireland	939,900	435,400	993,700	378,200	—	280,400	280,400	335,100	97,600
Poland	3,547,800	1,483,800	3,167,600	1,229,600	196,600	1,067,000	1,263,600	674,400	9,000
Slovakia	619,000	193,000	399,000	140,600	28,800	142,500	171,300	87,100	—
Total	25,759,100	10,741,200	25,047,500	9,345,200	808,800	7,472,400	8,281,200	7,421,100	6,295,200

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- (1) Homes Passed are homes, residential multiple dwelling units or commercial units that can be connected to our networks without materially extending the distribution plant. Certain of our Homes Passed counts are based on census data that can change based on either revisions to the data or from new census results. Due to the fact that we do not own the partner networks (defined below) used in Switzerland (see note 10 below), we do not report homes passed for Switzerland's partner networks.
 - (2) Fixed-Line Customer Relationships are the number of customers who receive at least one of our broadband internet, video or telephony services that we count as Revenue Generating Units (RGUs), without regard to which or to how many services they subscribe. Fixed-Line Customer Relationships generally are counted on a unique premises basis. Accordingly, if an individual receives our services in two premises (e.g., a primary home and a vacation home), that individual generally will count as two Fixed-Line Customer Relationships. We exclude mobile-only customers from Fixed-Line Customer Relationships.
 - (3) RGU is separately a Basic Video Subscriber, Enhanced Video Subscriber, Internet Subscriber or Telephony Subscriber (each as defined and described below). A home, residential multiple dwelling unit, or commercial unit may contain one or more RGUs. For example, if a residential customer in our U.K. market subscribed to our enhanced video service, fixed-line telephony service and broadband internet service, the customer would constitute three RGUs. Total RGUs is the sum of Basic Video, Enhanced Video, Internet and Telephony Subscribers. RGUs generally are counted on a unique premises basis such that a given premises does not count as more than one RGU for any given service. On the other hand, if an individual receives one of our services in two premises (e.g., a primary home and a vacation home), that individual will count as two RGUs for that service. Each bundled cable, internet or telephony service is counted as a separate RGU regardless of the nature of any bundling discount or promotion. Non-paying subscribers are counted as subscribers during their free promotional service period. Some of these subscribers may choose to disconnect after their free service period. Services offered without charge on a long-term basis (e.g., VIP subscribers or free service to employees) generally are not counted as RGUs. We do not include subscriptions to mobile services in our externally reported RGU counts. In this regard, our RGU counts exclude our separately reported postpaid and prepaid mobile subscribers.
 - (4) Internet Subscriber is a home, residential multiple dwelling unit or commercial unit that receives internet services over our networks, or that we service through a partner network. In Switzerland, we offer a 2 Mbps internet service to our Basic and Enhanced Video Subscribers without an incremental recurring fee. Our Internet Subscribers in Switzerland include 70,400 subscribers who have requested and received this service.
 - (5) Basic Video Subscriber is a home, residential multiple dwelling unit or commercial unit that receives our video service over our broadband network either via an analog video signal or via a digital video signal without subscribing to any recurring monthly service that requires the use of encryption-enabling technology. Encryption-enabling technology includes smart cards, or other integrated or virtual technologies that we use to provide our enhanced service offerings. We count RGUs on a unique premises basis. In other words, a subscriber with multiple outlets in one premises is counted as one RGU and a subscriber with two homes and a subscription to our video service at each home is counted as two RGUs. We have approximately 27,900 "lifeline" customers that are counted on a per connection basis, representing the least expensive regulated tier of video cable service, with only a few channels.
 - (6) Enhanced Video Subscriber is a home, residential multiple dwelling unit or commercial unit that receives our video service over our broadband network or through a partner network via a digital video signal while subscribing to any recurring monthly service that requires the use of encryption-enabling technology. Enhanced Video Subscribers are counted on a unique premises basis. For example, a subscriber with one or more set-top boxes that receives our video service in one premises is generally counted as just one subscriber. An Enhanced Video Subscriber is not counted as a Basic Video Subscriber. As we migrate customers from basic to enhanced video services, we report a decrease in our Basic Video Subscribers equal to the increase in our Enhanced Video Subscribers. Subscribers to enhanced video services provided by our operations in Switzerland over partner networks receive basic video services from the partner networks as opposed to our operations.
 - (7) Telephony Subscriber is a home, residential multiple dwelling unit or commercial unit that receives voice services over our networks, or that we service through a partner network. Telephony Subscribers exclude mobile telephony subscribers. In Switzerland, we offer a basic phone service to our Basic and Enhanced Video Subscribers without an incremental recurring fee. Our Telephony Subscribers in Switzerland include 183,300 subscribers who have requested and received this service.
 - (8) Our Mobile Subscriber count represents the number of active subscriber identification module (SIM) cards in service rather than services provided. For example, if a Mobile Subscriber has both a data and voice plan on a smartphone this would equate to one Mobile Subscriber. Alternatively, a subscriber who has a voice and data plan for a mobile handset and a data plan for a laptop would be counted as two Mobile Subscribers. Customers who do not pay a recurring monthly fee are excluded from our Mobile Subscriber counts after periods of inactivity ranging from 30 to 90 days, based on industry standards within the respective country. In a number of countries, our Mobile Subscribers receive mobile services pursuant to prepaid contracts. As of December 31, 2019, our Mobile Subscriber count included 444,600 and 263,900 prepaid Mobile Subscribers in Belgium and the U.K., respectively.
 - (9) Pursuant to service agreements, Switzerland offers broadband internet, enhanced video and telephony services over networks owned by third-party cable operators ("partner networks"). A partner network RGU is only recognized if there is a direct billing relationship with the customer. At December 31, 2019, Switzerland's partner networks account for 118,300 Fixed-Line Customer Relationships, 299,300 RGUs, which include 109,400 Internet Subscribers, 104,200 Enhanced Video Subscribers and 85,700 Telephony Subscribers.

Subscribers to our enhanced video services provided over partner networks receive basic video services from the partner networks as opposed to our operations.

Additional General Notes to Table:

Most of our broadband communications subsidiaries provide telephony, broadband internet, data, video or other business services. Certain of our business service revenue is derived from small or home office (**SOHO**) subscribers that pay a premium price to receive enhanced service levels along with video, internet or telephony services that are the same or similar to the mass marketed products offered to our residential subscribers. All mass marketed products provided to SOHOs, whether or not accompanied by enhanced service levels and/or premium prices, are included in the respective RGU and customer counts of our broadband communications operations, with only those services provided at premium prices considered to be "SOHO RGUs" or "SOHO customers". To the extent our existing customers upgrade from a residential product offering to a SOHO product offering, the number of SOHO RGUs or SOHO customers will increase, but there is no impact to our total RGU or customer counts. With the exception of our business SOHO subscribers, we generally do not count customers of business services as customers or RGUs for external reporting purposes.

In Belgium, Telenet leases a portion of its network under a long-term finance lease arrangement. These tables include operating statistics for Telenet's owned and leased networks.

While we take appropriate steps to ensure that subscriber statistics are presented on a consistent and accurate basis at any given balance sheet date, the variability from country to country in (1) the nature and pricing of products and services, (2) the distribution platform, (3) billing systems, (4) bad debt collection experience and (5) other factors add complexity to the subscriber counting process. We periodically review our subscriber counting policies and underlying systems to improve the accuracy and consistency of the data reported on a prospective basis. Accordingly, we may from time to time make appropriate adjustments to our subscriber statistics based on those reviews.

Subscriber information for acquired entities is preliminary and subject to adjustment until we have completed our review of such information and determined that it is presented in accordance with our policies.

Products and Services

WiFi and Internet Services

Connectivity is a building block for vibrant communities. Our fiber-rich broadband network is the backbone of our business and the basis of our connectivity strategy. To meet our customers' expectations to be seamlessly connected, we are investing in the expansion of our broadband network, mobile and WiFi solutions and customer premises equipment.

Internet speed is of crucial importance to our customers, as they spend more time streaming video and other bandwidth-heavy services on multiple devices. Our extensive broadband network enables us to deliver ultra high-speed internet service across our markets. Our residential subscribers access the internet via cable modems connected to their internet capable devices, or wirelessly via a WiFi gateway device. We offer multiple tiers of broadband internet service ranging from a basic service of 50 Mbps in Slovakia to an ultra high-speed internet service of 1 Gbps in parts of the Netherlands through the VodafoneZiggo JV, Belgium, Switzerland and parts of Poland and Slovakia, and speeds up to 1.1 Gbps in parts of the U.K.

The speed of service depends on the location and the tier of service selected. In addition, by leveraging our existing fiber-rich broadband networks and our Network Extensions, we are in a position to deliver gigabit services by deploying the next generation DOCSIS 3.1 technology. We currently offer this technology in the U.K., parts of the Netherlands through the VodafoneZiggo JV, Poland and Slovakia. By using DOCSIS 3.1, we can extend our download speeds to at least 1 Gbps where deployed. DOCSIS 3.1 technology improves not only our internet speed offers but also allows for network growth. DOCSIS technology is an international standard that defines the requirements for data transmission over a cable system. Currently, our ultra high-speed internet service is based primarily on DOCSIS 3.1 technology.

Our internet service generally includes email, address book and parental controls. We offer value-added broadband services in certain of our markets for an incremental charge. These services include security (e.g., anti-virus, anti-spyware, firewall and spam protection) and online storage solutions and web spaces. In many of our markets, we offer mobile broadband services with internet access as described below. Subscribers to our internet service pay a monthly fee based on the tier of service selected. In addition to the monthly fee, customers pay an activation service fee upon subscribing to an internet service. This one-time fee may be waived for promotional reasons. We determine pricing for each different tier of internet service through an analysis of speed, market conditions and other factors.

Our "**Connect Box**" is a dedicated connectivity device that delivers superior in-home WiFi coverage. It is our next generation WiFi and telephony gateway that enables us to maximize the impact of our ultrafast broadband networks by providing reliable wireless connectivity anywhere in the home. It has an automatic WiFi optimization function, which selects the best possible wireless frequency at any given time. This gateway can be self-installed and allows customers to customize their home WiFi service. Our Connect Box is available in all our markets, and currently, approximately 72% of our customers have a Connect Box. In addition to our markets, we distribute Connect Box to other markets in Europe, Latin America and the Caribbean, connecting almost 14 million homes. Robust wireless connectivity is increasingly important with our customers spending more and more time using bandwidth-heavy services on multiple devices. In Belgium, Switzerland and the U.K., we also offer a connect app that allows our customers to find their best WiFi access. In addition, WiFi boosters are available in all our markets to optimize connectivity. We also brought to market and are looking to expand the availability of our new Gigabit Connect Box based on DOCSIS 3.1 technology that provides even better in-home WiFi service to customers.

In all of our markets, we have deployed community WiFi via routers in the home (**the Community WiFi**), which provides secure access to the internet for our customers. Community WiFi is enabled by a cable modem WiFi access point (**WiFi modem**) in a Connect Box, a set-top box or a Horizon box of our internet customers. The Community WiFi is created through the sharing of access to the public channel of our customers' home wireless routers. The public channel is a separate network from the secure private network used by the customer within the home and is automatically enabled when the WiFi modem is installed. Public WiFi access points (covering train stations, hotels, bars, restaurants and other public places) are also available for no additional cost.

Video Services

Our video service is, and continues to be, one of the foundations of our product offerings in our markets. Our cable operations offer multiple tiers of digital video programming and audio services starting with a basic video service. Subscribers to our basic video service pay a fixed monthly fee and receive digital or analog video channels (including a limited number of high definition (**HD**) and ultra high definition 4K resolution (**4K**) channels) and several digital and analog radio channels, as well as an electronic programming guide. In Poland, where our basic digital service is unencrypted, the cost of our digital service is the same cost as the monthly fee of our analog service. In the markets where we encrypt our basic digital service, our digital service is generally

offered at an incremental cost equal to or slightly higher than the monthly fee for our basic analog service. We tailor our video services in each country of operation based on programming preferences, culture, demographics and local regulatory requirements.

We also offer a variety of premium channel packages to meet the special interests of our subscribers. For an additional monthly charge, a subscriber may upgrade to one of our extended digital tier services and receive an increased number of video and radio channels, including the channels in the basic tier service and additional HD and 4K channels. Digital subscribers may also subscribe to one or more packages of premium channels for an additional monthly charge. Our channel offerings include general entertainment, sports, movies, documentaries, lifestyles, news, adult, children and ethnic and foreign channels. Subscribers to our digital services also receive the channels available through our limited analog services, which are available in Belgium, Poland and Slovakia. In all of our broadband operations, we continue to upgrade our systems to expand our digital services and encourage our analog subscribers to convert to a basic digital or premium digital service.

Discounts to our monthly service fees are available to any subscriber who selects a bundle of two or more of our services (**bundled services**): video, internet, fixed-line telephony and, in most of our markets, mobile services. Bundled services consist of double-play for two services, triple-play for three services and, where available, quad-play for four services.

To meet customer demands, we have enhanced our video services with various products that enable our customers to control when, where and how they watch their programming. These products range from digital video recorders (**DVRs**) to multimedia home gateway systems such as **'Horizon TV'**, as well as various mobile applications (**apps**). Horizon TV is a next generation multimedia home gateway (decoder box) based on a digital television platform that is capable of distributing video, voice and data content throughout the home and to multiple devices. It has a sophisticated user interface that enables customers to view and share, across multiple devices, linear channels, video-on-demand (**VoD**) programming and personal media content, and to pause, replay and record programming. The Horizon TV gateway can act as an internet router that allows access to digital video content available on the television via other devices, such as laptops, smart phones and tablets.

In 2018 and 2019, we introduced our latest set top boxes in various of our markets, which are capable of delivering 4K and enhanced high dynamic range or HDR video content. These set top boxes carry the next generation Horizon TV user interface that we call **'Horizon 4'**. Horizon 4 is a multiscreen entertainment platform that combines linear television, VoD and mobile viewing. In addition to the features of Horizon TV, Horizon 4 allows customers to pause a program, series or movie and seamlessly continue watching from where they left off on another device, whether a television, tablet, smart phone or laptop. Customers also have access to cloud storage for up to 2,000 hours of recording, as well as our Replay TV service (described below). Customers can control their Horizon 4 enabled set-top box with voice commands using the accompanying remote control. Horizon 4 is marketed under the name "Telenet TV-Box" in Belgium, "UPC TV" in Switzerland and "MediaBox Next" in the Netherlands through the VodafoneZiggo JV. We intend to continue the roll out of Horizon 4 capabilities in the rest of our footprint.

For our Horizon TV and Horizon 4 subscribers, we offer various features and functionalities, including television apps for various online services (such as YouTube, Netflix, social platforms, sports experience, music, news and games). In almost all of our operations, we also offer an online mobile app for viewing on a second screen that is based on our **"Horizon Go"** platform. Horizon Go is available on mobile devices (iOS, Android and Windows) and via an internet portal and allows video customers to view linear channels, VoD and Replay TV, with a substantial part of this content available outside of the home. In a number of markets, Horizon Go is also available on third-party devices, including Amazon Fire, Android TV and Apple TV. Additionally, Horizon Go has a "Download to Go" feature in a number of markets that allows the consumer to take content with them on their device. For Horizon TV and Horizon 4 customers, when in the home, the second screen device can act as a remote control. Through Horizon Go, customers have the ability to remotely schedule the recording of a television program on their Horizon TV or Horizon 4 box at home.

We offer Horizon TV in the Netherlands through the VodafoneZiggo JV, Switzerland, Ireland and Poland. In most of our other European operations, we provide a Horizon TV-like experience through a remotely upgraded version of the software on the customer's set-top box. After the upgrade, these boxes offer several features of the Horizon TV product. We refer to this upgrade as **"Horizon Lite"**, although it is locally marketed as Horizon TV, except in Belgium where it is marketed as "Digital TV". Some of the Horizon TV features are not available on our Horizon Lite systems, such as recommendation-based content and the ability to access video content on other devices in the home. We intend to continue to improve the Horizon TV user experience with new functionality and software updates.

In the U.K., we offer a multimedia home gateway based on the TiVo platform under a strategic partnership agreement with TiVo Inc. Through the TiVo platform, we offer our U.K. customers a basic set-top box or the Virgin Media V6 box. Both boxes provide television and broadband internet capabilities. Similar to Horizon 4, the Virgin Media V6 box combines 4K video, including high dynamic range, with improved streaming functionalities and more processing power. The Virgin Media V6 box allows customers to record six channels simultaneously while watching a seventh. Customers can also start watching programming on one television and pick up where they left off on other TiVo boxes in another room or through an app on their smart phones and

tablets. Over 60% of our U.K. customers have the Virgin Media V6 box. In addition to the video service on their TiVo gateway device, our customers in the U.K. also have access to a comprehensive internet streaming video service called “Virgin TV Go”. This service, which is available via a mobile app or an internet portal, allows our video customers to stream real-time TV channels and watch VoD content anywhere they have an internet connection. Our enhanced video customers can also download certain on-demand programs to their compatible devices for off-line viewing via the Virgin TV Go app.

In Belgium, Telenet launched Telenet TV Box utilizing the Horizon 4 platform in 2019, as well as an enhanced multiscreen service based on Horizon Go. Telenet also offers customers access to live TV streaming and various other content sources such as VoD via its “Yelo Play” app, which is available via iOS and Android smart phones and tablets. Digital TV set-top boxes and Yelo Play offer a Horizon TV-like user interface that allow Telenet's enhanced video customers to remotely manage their DVR, view programs remotely (up to seven days after the original broadcast) and access VoD with a laptop, smart phone or tablet in or out of the home.

One of our key video services is “**Replay TV**”. Replay TV records virtually all programs across numerous linear channels in the countries where this service is available. The recordings are available up to seven days after the original broadcast. This allows our customers to catch up on their favorite television shows without having to set their DVR or browse separate menus on their set-top boxes. Instead, customers can open the electronic programming guide, scroll back and replay linear programming instantly. Replay TV also allows our customers to replay a television program from the start even while the live broadcast is in progress. Replay TV is one of the most used and appreciated features on our platforms. It is accessible in all of our markets, except in the U.K., through our Horizon services, and in some of our markets also via Horizon Go.

In most of our markets, we offer transactional VoD giving subscribers access to thousands of movies and television series. In several of our markets, our subscription VoD service is included in our enhanced video services accessed through the Horizon TV platform. This service is tailored to the specific market based on available content, consumer preferences and competitive offers, and includes various programming, such as music, kids, documentaries, adult, sports and TV series. In Belgium, the service is marketed as “Play” and “Play More”. We continue to develop our VoD services to provide a growing collection of programming from local and international suppliers, such as ABC/Disney, A+E Networks, NBC/Universal, CBS/Paramount, Discovery, the BBC, Warner and Sony, among others. Customers who subscribe to an extended digital tier generally receive a VoD enabled set-top box without an additional monthly charge. In addition, in many of our markets we offer premium over the top (**OTT**) services like Netflix and Amazon Prime Video via certain of our set-top boxes.

Subscribers access our enhanced video service by renting a set-top box with a smart card from our operators, or without a set-top box if a subscriber is only using our basic video service. Where Horizon TV is available, a subscriber to our enhanced video services has the option, for an incremental monthly charge, to upgrade the standard digital set-top box to a Horizon TV box or Horizon 4 for our Switzerland customers (both of which have HD DVR capabilities and other additional features). No set-top box or smart card, however, is required to receive our basic digital services in our unencrypted footprint in Poland. In addition, expanded channel packages and premium channels and services are available for an incremental monthly fee in all of our markets.

Mobile Services

Mobile services are another key building block for us to provide customers with seamless connectivity. We offer mobile services as an MVNO over third-party networks in the U.K., Switzerland, Ireland and Poland. Following the February 2016 acquisition of BASE, Telenet became a mobile network provider in Belgium.

In the U.K., Switzerland, Ireland and Poland, where we provide our mobile telephony services as MVNOs, we lease a third-party's radio access network and own the core network, including switching, backbone and interconnections. These arrangements permit us to offer our customers in these markets mobile services without having to build and operate a cellular radio tower network.

Our MVNO partners are:

<u>Country</u>	<u>Partner</u>
U.K.	BT / EE ⁽¹⁾
Switzerland	Swisscom ⁽²⁾
Ireland	Three (Hutchison)
Poland	Orange/Play

⁽¹⁾ Our U.K. operations agreed to a new MVNO agreement with Vodafone U.K. in November 2019, however, the MVNO arrangement with EE will continue until the end of 2021 by which time the full migration to the Vodafone U.K. network is expected to be complete.

- (2) Our Switzerland operations completed migration to the Swisscom AG (Swisscom) network in the beginning of 2019, and also have the right to access the Sunrise Communications Group AG (**Sunrise**) network as a secondary option.

Where mobile services are available, subscribers pay varying monthly fees depending on whether the mobile service is combined with our cable services or includes mobile data services via mobile phones, tablets or laptops. We offer our customers the option to purchase mobile handsets and, in most of our markets, make such purchase pursuant to a contract independent of their mobile services contract. We refer to these arrangements as split contracts. In Belgium, for those subscribers on Telenet's own network, it is offering more flexible bundles adjusted to customers' needs so they can use the full capacity of their package, regardless of their appetite to use either more data, minutes or text messages. As a mobile network provider, Telenet also has agreements with other mobile providers to use its mobile network for their mobile offerings.

Our mobile services typically include voice, short message service (**orSMS**) and internet access. Calls, both within and out of network, incur a charge or are covered under a postpaid monthly service plan. Our mobile services are primarily on a postpaid basis with customers subscribing to services for periods ranging from activation for a SIM-only contract to up to 24 months (or 36 months in the U.K.), with the latter often taken with a subsidized mobile handset. In Belgium and Switzerland, however, our postpaid service is offered without a minimum contract term. In the U.K. and Belgium, we also offer a prepaid service, where the customers pay in advance for a pre-determined amount of airtime or data and generally have no minimum contract term. In almost all of our markets, subscribers to a double- or triple-play bundle receive a discount on their mobile service fee.

Telephony Services

Multi-feature telephony services are available through voice-over-internet-protocol (**VoIP**) technology in most of our broadband communication markets. In the U.K., we also provide traditional circuit-switched telephony services. We pay interconnect fees to other telephony and internet providers when calls by our subscribers terminate on another network and receive similar fees from providers when calls by their users terminate on our network through interconnection points.

Our telephony service may be selected in several of our markets on a standalone basis and in all of our markets in combination with one or more of our other services. Our telephony service includes a basic fixed-line telephony product for line rental and various calling plans, which may consist of any of the following: unlimited network, national or international calling, unlimited off-peak calling and minute packages, including calls to fixed and mobile phones. We also offer value added services, such as a personal call manager, unified messaging and a second or third phone line at an incremental cost.

Multiple Dwelling Units and Partner Networks

Pursuant to an agreement executed on June 28, 2008 (the **PICs Agreement**) with four associations of municipalities in Belgium (the pure intercommunales or **PICs**), Telenet leases the PICs broadband communications network and, accordingly, makes its services available to all of the homes passed by the cable network owned by the PICs. Telenet has a direct customer relationship with the basic and enhanced video subscribers on the PICs network. Pursuant to the PICs Agreement, Telenet has full rights to use substantially all of the PICs network under a long-term finance lease. Unless extended, the PICs Agreement will expire on September 23, 2046, and cannot be terminated earlier (except in the case of non-payment or bankruptcy of Telenet). For additional information on the PICs Agreement, see note 19 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

For over half of the basic video subscribers of UPC Switzerland, UPC Switzerland maintains billing relationships with landlords or housing associations and provides basic video service to the tenants. The landlord or housing association administers the billing for the basic video service with their tenants and manages service terminations for their rental units. When tenants select triple-play bundles with or without mobile service from UPC Switzerland, they then migrate to a direct billing relationship with us.

UPC Switzerland offers broadband internet, enhanced video and telephony services directly to the video cable subscribers of those partner networks that enter into service operating contracts with UPC Switzerland. UPC Switzerland has the direct customer billing relationship with these subscribers. By permitting UPC Switzerland to offer some or all of its broadband internet, enhanced video and telephony products directly to those partner network subscribers, UPC Switzerland's service operating contracts have expanded the addressable markets for UPC Switzerland's digital products. In exchange for the right to provide digital products directly to the partner network subscribers, UPC Switzerland pays to the partner network a share of the revenue generated from those subscribers. UPC Switzerland also provides network maintenance services and engineering and construction services to its partner networks.

Business Services

In addition to our residential services, we offer business services in all of our operations. For business and public sector organizations, we provide a complete range of voice, advanced data, video, wireless and cloud-based services, as well as mobile

and converged fixed-mobile services. Our business customers include SOHO (generally up to five employees), small business and medium and large enterprises. We also provide business services on a wholesale basis to other operators.

Our business services are designed to meet the specific demands of our business customers with a wide range of services, including increased data transmission speeds and virtual private networks. These services fall into five broad categories:

- VoIP and circuit-switch telephony, hosted private branch exchange solutions and conferencing options;
- data services for internet access, virtual private networks and high capacity point-to-point services;
- wireless services for mobile voice and data, as well as managed WiFi networks;
- video programming packages and select channel lineups for targeted industries; and
- value added services, including webhosting, managed security systems and storage and cloud enabled software.

Our intermediate to long-term strategy is to enhance our capabilities and offerings in the business sector so we become a preferred provider in the business market. To execute this strategy, customer experience and strategic marketing play a key role.

Our business services are provided to customers at contractually established prices based on the size of the business, type of services received and the volume and duration of the service agreement. SOHO and small business customers pay business market prices on a monthly subscription basis to receive enhanced service levels and business features that support their needs. For more advanced business services, these customers generally enter into a service agreement. For medium to large business customers, we enter into individual agreements that address their needs. These agreements are generally for a period of at least one year.

Investments—VodafoneZiggo JV

We own a 50% interest in the VodafoneZiggo JV, which is a leading Dutch company that provides fixed, mobile and integrated communication and entertainment services to consumers and businesses in the Netherlands. In connection with the formation of the VodafoneZiggo JV, we entered into a shareholders agreement with Vodafone providing for the governance of the VodafoneZiggo JV, including decision-making process, information access, dividend policy and non-compete provisions. It also provides for restrictions on transfer of interests in the VodafoneZiggo JV and exit arrangements. Under the dividend policy, the VodafoneZiggo JV is required to distribute all unrestricted cash to Vodafone and us, subject to minimum cash requirements and financing arrangements. We also entered into a framework agreement with the VodafoneZiggo JV to provide access to each partner's expertise in the telecommunications business. For additional information on the above agreements, see note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

The fiber-rich broadband network of the VodafoneZiggo JV passes 7.3 million homes. The VodafoneZiggo JV also offers nationwide mobile coverage. At December 31, 2019, the VodafoneZiggo JV had 9.6 million RGUs, of which 3.9 million were video, 3.3 million were broadband internet and 2.4 million were fixed-line telephony. In addition, the VodafoneZiggo JV had 5.1 million mobile (including 0.6 million prepaid) customers. Besides its residential services, the VodafoneZiggo JV offers extensive business services throughout the Netherlands. The operations of the VodafoneZiggo JV are subject to various regulations, which are described below under *Regulatory Matters—The Netherlands*.

The VodafoneZiggo JV's customers continue to have access to Horizon TV and its functionalities (marketed as "Ziggo TV"), including Replay TV, the Ziggo Go app, pause live TV and VoD, 500 Mbps nationwide broadband internet and an extensive WiFi community network. The VodafoneZiggo JV also has its own sports channel, Ziggo Sport, and offers exclusive programming, such as HBO. Additionally, as of October 2019, the VodafoneZiggo JV has made 1 Gbps broadband internet available in parts of its service area. Approximately 1.9 million customers have the capability to use the Connect Box for their in-home WiFi service. The VodafoneZiggo JV's customers also have access to Vodafone's nationwide long-term evolution wireless service, also called "4G" (referred to herein as LTE) services, under either a prepaid or postpaid service plan. The VodafoneZiggo JV provides its mobile services under various licenses. The license for its 3G services expires in 2020. The bandwidth under this license will be re-auctioned in the first half of 2020. With its mobile services, the VodafoneZiggo JV is able to offer quad-play bundles and converged services to its residential and business customers.

For all its services, the VodafoneZiggo JV competes primarily with the provision of similar services from the incumbent telecommunications operator Koninklijke KPN N.V. (KPN). KPN offers (1) internet protocol television (IPTV) over fiber optic lines where the fiber is to the home, cabinet, or building or to the node networks (fiber-to-the-home/-cabinet/-building/-node is referred to herein as FTTx) and through broadband internet connections using digital subscriber lines (DSL) or very high-speed DSL technology (VDSL) or an enhancement to VDSL called "vectoring", (2) digital terrestrial television (DTT), and (3) LTE services. Where KPN has enhanced its VDSL system, it offers broadband internet with download speeds of up to 200 Mbps and on its FTTx networks, it offers download speeds of up to 1 Gbps. Its ability to offer a bundled triple-play of broadband internet,

video and telephony services and fixed-mobile convergence services creates significant competitive pressure on the VodafoneZiggo JV's operations, including the pricing and bundling of its video products. KPN's video services include many of the interactive features that the VodafoneZiggo JV offers its subscribers, including pausing live TV, replay and third party apps. Portions of the VodafoneZiggo JV's network have been overbuilt by KPN's and other providers' FTTx networks and expansion of these networks is expected to continue. Another significant competitor is the Netherlands operations of Deutsche Telekom.

Additional Business Information

Technology

In most of our markets, our broadband internet, video and fixed-line telephony services are transmitted over a hybrid fiber coaxial cable network. This network is composed primarily of national and regional fiber networks, which are connected to the home over the last few hundred meters by coaxial cable.

We closely monitor our network capacity and customer usage. Where necessary, we increase our capacity incrementally, for instance by splitting nodes in our cable network. We also continue to explore improvements to our services and new technologies that will enhance our customer's connected entertainment experience. These actions include:

- recapturing bandwidth and optimizing our networks by:
 - increasing the number of nodes in our markets;
 - increasing the bandwidth of our hybrid fiber coaxial cable network to 1 GHz;
 - converting analog channels to digital;
 - deploying additional DOCSIS 3.1 channels;
 - replacing copper lines with modern optic fibers; and
 - using digital compression technologies.
- freeing spectrum for high-speed internet, VoD and other services by encouraging customers to move from analog to digital services;
- increasing the efficiency of our networks by moving headend functions (encoding, transcoding and multiplexing) to cloud storage systems;
- enhancing our network to accommodate business services;
- using wireless technologies to extend our services outside of the home;
- offering remote access to our video services through laptops, smart phones and tablets;
- expanding the availability of Horizon TV and Virgin TV Go, as well as Horizon 4, and related products and developing and introducing online media sharing and streaming or cloud-based video; and
- testing new technologies.

As stated under *General Development of Business—Expansion and Acquisitions* above, we are expanding our hybrid fiber coaxial cable network through our Network Extensions. In addition, we are seeking mobile service opportunities where we have established cable networks and expanding our fixed-line networks where we have a strong mobile offering. This will allow us to offer converged fixed-line and mobile services to our customers.

We deliver high-speed data and fixed-line telephony over our broadband network in our markets. The cable networks of our operations in Europe are connected to our "Aorta" backbone. The Aorta backbone is recognized as a Tier 1 Carrier, which permits us to serve our customers through settlement free collaboration with other carriers without the cost of using a third-party network.

In support of our connectivity strategy, we are moving our customers into a gigabit society. Almost all of our broadband networks are already capable of supporting the next generation of ultra high-speed internet service at gigabit speeds. To provide these speeds to our subscribers, we launched our next generation gateways that will enable DOCSIS 3.1 technology throughout our footprint. The use of DOCSIS 3.1 technology provides us significantly higher efficiencies on our networks and allow us to offer faster speeds, in-home WiFi and better services. The new gateways and the continued upgrades to our network in the coming years will allow us to maximize high-speed connectivity over our broadband networks and deliver gigabit services in a cost-effective manner. It will also allow us to meet the expectations of our customers for high-speed internet access both in cities and rural areas of our footprint.

Supply Sources

Content. With telecommunication companies offering similar services, content is one of the deciding factors for customers in selecting a video services provider. Therefore, in addition to providing services that allow our customers to view programming when and where they want, we are investing in content that customers want. Our content strategy is based on:

- proposition (exceeding our customers' entertainment desires and expectations);
- product (delivering the best content available);
- procurement (investment in the best brands, shows and sports); and
- partnering (strategic alignment, acquisitions and growth opportunities).

We license almost all of our programming and on-demand offerings from content providers and third-party rights holders, including broadcasters and cable programming networks. Under our distribution agreements, we generally pay a monthly fee on a per channel or per subscriber basis, with occasional minimum pay guarantees. For on-demand programming, we generally pay a revenue share for transactional VoD (often with minimum guarantees) and a flat fee or a monthly fee per subscriber for subscription VoD. For a majority of our agreements, we seek to include the rights to offer the licensed programming to our customers through multiple delivery platforms and through our apps for smart phones and tablets.

In seeking licenses for content, our primary focus is on partnering with leading international providers, such as Disney, Warner Media (including HBO), Fox, the BBC and Discovery. We also seek to carry in each of our markets key public and private broadcasters and in some markets we acquire local premium programming through select relationships with companies such as Sky plc (**Sky**) (U.K. and Ireland) and BT Group plc (**BT**). For our VoD services, we license a variety of programming, including box sets of television series, movies, music, kids' programming and documentaries. In addition, we currently have arrangements with Netflix International B.V. (**Netflix**) and with Amazon Europe Core S.A.R.L. (**Amazon**). Pursuant to these arrangements, the Netflix service and Amazon Prime Video services respectively are available via certain of our set-top boxes to our video customers across many of our markets each as premium OTT services. The Netflix app is available to our customers in the U.K., the Netherlands through the VodafoneZiggo JV, Ireland, Switzerland and Belgium. We have also just signed a long term renewal agreement with Netflix for the provision of the Netflix app on various of our set top boxes across the E.U. The Amazon Prime app is currently available to our customers in the U.K.

Exclusive content is another element of our content strategy. To support this approach, we are investing in content assets. We have invested in various content companies, including ITV plc, All3Media Ltd., LionsGate Entertainment, STX, Virgin Media TV (formerly TV3 Group in Ireland) and De Vijver Media. We are also investing in sports, both as a broadcaster and as a rights owner. We have our own exclusive sports channels, *Play Sports* in Belgium, and *MySports* in Switzerland, which UPC Switzerland licenses to other non-competing cable operations in Switzerland. Also, the VodafoneZiggo JV owns *Ziggo Sport*. The basic *Ziggo Sport* service is available exclusively to the VodafoneZiggo JV's customers; however, the premium service is widely available through license arrangements.

In addition, we have commissioned our own drama series content. Through All3Media Ltd., which we own jointly with Discovery, Inc., we co-produced a television series, known as *The Feed*, which was released in 2019 in several of our markets, and will continue to co-produce *Blood* in Ireland. With LionsGate Entertainment, we pre-purchased the spy thriller series *The Rook*, which premiered in 2019. In addition, we have produced the Swiss sitcom *Fassler-Kunz*, the Swiss series *Im Heimatland* and the original Belgium series *Chaussée d'Amour* and *De Dag* with local production companies. These television series will primarily be available to our customers on an on-demand basis. We will also continue to co-produce content for our free-to-air (**FTA**) assets and VoD platforms in Ireland, and Telenet will continue to co-produce content for its FTA assets and VoD platforms in Belgium.

Customer Premises Equipment. We purchase each type of customer premises equipment from a number of different suppliers, with at least two or more suppliers providing our high-volume products. Customer premises equipment includes set-top boxes, modems, WiFi routers, DVRs, tuners and similar devices. For each type of equipment, we retain specialists to provide customer support. For our broadband services, we use a variety of suppliers for our network equipment and the various services we offer. Similarly, we use a variety of suppliers for mobile handsets to offer our customers mobile services.

Software Licenses. We license software products, including email and security software, and content, such as news feeds, from several suppliers for our internet services. The agreements for these products require us to pay a fee for software licenses and a share of advertising revenue for content licenses. For our TiVo service in the U.K., we have a partnership arrangement where TiVo is the provider of the user interface software for our next generation set-top boxes, which provides converged television and broadband internet capabilities. In 2017, we entered into a multi-year extension of our agreements with TiVo. For our mobile

network operations and our fixed-line telephony services, we license software products, such as voicemail, text messaging and caller ID, from a variety of suppliers. For these licenses we seek to enter into long-term contracts, which generally require us to pay based on usage of the services.

For our mobile services provided through MVNO arrangements, we are dependent on third-party wireless network providers. Each of our MVNO operations has an agreement with such a provider to carry the mobile communications traffic of our customers. We seek to enter into medium to long-term arrangements for these services. Any termination of these arrangements could significantly impact our mobile services.

Competition

All of our businesses operate in highly competitive and rapidly evolving markets. Technological advances and product innovations have increased and are likely to continue to increase, giving customers several options for the provision of their telecommunications services. Our customers want access to high quality telecommunication services that allow for seamless connectivity. Accordingly, our ability to offer converged services (video, internet, fixed telephony and mobile) is a key component of our strategy. In many of our markets, we compete with companies that provide fixed-mobile convergence bundles, as well as companies that are established in one or more communication products and services. Consequently, our businesses face significant competition. In all markets, we seek to differentiate our telecommunication services by focusing on customer service, competitive pricing and offering quality high-speed internet. In this section, we begin with an overview on the competitive nature of the broadband internet, video and mobile and fixed-line telephony services in our markets, and then provide information on key competitors in our more material markets.

We believe that our deep-fiber access provides us with several competitive advantages. For instance, our cable networks allow us to concurrently deliver internet access, together with real-time television and VoD content, without impairing our high-speed internet service. In addition, our cable infrastructure allows us to provide triple-play bundled services of broadband internet, television and fixed-line telephony services without relying on a third-party service provider or network. Where mobile is available, our mobile networks, together with our fixed fiber-rich networks, allow us to provide a comprehensive set of converged mobile and fixed-line services. Our capacity is designed to support peak consumer demand. In serving the business market, many aspects of the network can be leveraged at very low incremental costs given that business demand peaks at a time when consumer demand is low, and peaks at lower levels than consumer demand.

Overall, we are experiencing increased convergence as customers look to receive all their media and communication services from one provider. In our largest video markets, our key competitors for the provision of converged services are: BT (U.K.), Proximus NV/SA (**Proximus**) (Belgium) and Swisscom (Switzerland). Also, as described above under *Products and Services—Investments—VodafoneZiggo JV*, the key competitor for the VodafoneZiggo JV is KPN. Each of these competitors have extensive resources allowing them to offer competitively priced bundled services. As a result, our ability to offer triple-play or quad-play bundles and fixed-mobile convergence bundles is one of our key strategies to attract and retain customers. We seek to distinguish ourselves through our multimedia gateway services, interactive services (such as Replay TV and VoD), proprietary sports offerings, expanded content offers (for both in and out of the home) and our download speeds.

Portions of our European systems have been overbuilt by FTTx networks and other cable operations. These systems are a significant competitive factor, primarily for our Poland and Slovakia operations. Based on research of various telecommunication publications, including the Organization for Economic Cooperation and Development (**OECD**) and internal estimates, parts of our operations in Poland and Slovakia are overbuilt by FTTx networks. Other fiber and cable operators are estimated to have overbuilt approximately 80% of our footprint in Slovakia and 85% of our footprint in Poland. Although we have extensive FTTx overbuild in Switzerland, connectivity to the FTTx network is not available at all locations. In addition, government and quasi-government entities in certain of the countries in which we operate in Europe continue to invest in FTTx networks, creating another source of competition.

In order to achieve download speeds of up to 100 Mbps or greater for customers, incumbent telecommunications operators are adopting VDSL with vectoring and bonding technologies as a more cost efficient solution compared to FTTx initiatives. For example, Swisscom has implemented vectoring in Switzerland. Vectoring is a transmission method that coordinates line signals to reduce crosstalk levels and improve performance. Bonding is a method of taking channels on either DSL or cable plant and bonding those channels together for a higher bandwidth throughput.

Internet

With respect to broadband internet services and online content, our businesses face competition in a rapidly evolving marketplace from incumbent and non-incumbent telecommunications companies, mobile operators and cable-based ISPs, many of which have substantial resources. The internet services offered by these competitors include both fixed-line broadband internet

services using cable, DSL or FTTx networks and wireless broadband internet services. These competitors have a range of product offerings with varying speeds and pricing, as well as interactive services, data and other non-video services offered to homes and businesses. With the demand for mobile internet services increasing, competition from wireless services using various advanced technologies is a competitive factor. In several of our markets, competitors offer high-speed mobile data via LTE wireless networks, and 5G technology is gaining traction. In addition, other wireless technologies, such as WiFi, are available in all of our markets. In this intense competitive environment, speed and pricing are key drivers for customers.

Our strategy is speed leadership. Our focus is on increasing the maximum speed of our connections as well as offering varying tiers of service, prices, a variety of bundled product offerings and a range of value added services. We update our bundles and packages on an ongoing basis to meet the needs of our customers. Our download ultra high internet speed of 1Gbps is available in all of Belgium and Switzerland, as well as parts of the U.K., Poland and Slovakia. We use our ultra high-speed internet services with access to Community WiFi and competitively priced bundles to encourage customers from other providers to switch to our services. The focus is on high-end internet products to safeguard our high-end customer base and allow us to become more aggressive at the low- and medium-end of the internet market. By fully utilizing the technical capabilities of DOCSIS 3.0 technology on our cable systems, we can compete with local FTTx initiatives and create a competitive advantage compared to DSL infrastructures and LTE initiatives on a national level. Additionally, with the recent commercial deployment of our next generation gateways that enabled DOCSIS 3.1 on our cable networks, we further improved our high-speed internet offers.

Across Europe, our key competition in this product market is from the offering of broadband internet products using various DSL-based technologies by the incumbent phone companies and third parties. The introduction of cheaper and ever faster fixed-line broadband offerings is further increasing the competitive pressure in this market. Wireless broadband services, such as LTE, are also significant competitors using high-speed mobile networks. We are expanding our ultra high-speed services and increasing our download speeds. In most of our markets, we offer our internet service on a standalone basis or through bundled offerings that include video, fixed-line telephony and mobile services. Mobile data is also increasingly important and we are addressing this through our wide range of mobile products, including expanding our LTE service area and offering SIM-only mobile products, as well as expanding our Community WiFi network.

- Virgin Media. In the U.K., we have a number of significant competitors in the market for broadband internet services, including fixed-line incumbent telecommunications providers. Of these broadband internet providers, BT is the largest, which provides broadband internet access services to both its own retail customers and third-party retail providers over its own DSL network. BT has announced its intention to rollout ultrafast speeds of up to 300 Mbps by March 2020 to up to 2.7 million premises using G.fast technology, a DSL standard applied over copper local loops. While this is scaled back from its original intention, BT has refocused its efforts to rollout a FTTx service supporting 1 Gbps to four million homes and businesses by March 2021 with current plans to build FTTx in 103 locations, with a target to cover 15 million homes by 2025. As a result of these objectives, BT has launched a range of ultrafast consumer packages offering speeds of up to 145 Mbps and 300 Mbps, respectively, using a combination of G.fast and FTTx technology, which are currently available to 4.9 million U.K. homes.

Operators such as Sky and TalkTalk deploy their own network access equipment in BT exchanges via a process known as local loop unbundling (LLU). This allows an operator to reduce the recurring operating costs charged by BT by reducing the proportion of traffic that must travel directly over BT's network. LLU deployment requires a substantial capital investment to implement and requires a large customer base to deliver a return on investment. In addition to the competition and pricing pressure in the broadband market arising from LLU, competition from mobile broadband developments, such as LTE and 5G mobile services and WiFi services, is significant. Mobile providers continue to gain market share from fixed-line providers. These providers offer a range of mobile services.

- Telenet. In the Flanders region of Belgium, Telenet is the leading provider of residential broadband internet services. Telenet's primary competitor is the DSL service provider Proximus. Proximus is a well-established competitor offering quad-play bundles. Proximus' DSL and VDSL services provide download speeds up to 100 Mbps. Mobile broadband penetration reached nearly 80% of the total population by year-end 2018 based on the BIPT 2018 Annual Report. Similar to its video services, Telenet faces competition in the provision of internet services from other providers who have wholesale access to Telenet's cable network. Through such access, Orange Belgium currently offers its mobile subscribers a dual-play bundle including enhanced video and broadband internet services. In this competitive market, Telenet is using its fixed-mobile converged offers to promote its internet and other services.
- UPC Switzerland. In Switzerland, Swisscom is the largest provider of broadband internet services, and is UPC Switzerland's primary competitor. Swisscom internet customers have access to its basic video content free of charge through its internet portal. It is also expanding its FTTx network and rolling out G.fast technology. Swisscom offers download speeds ranging from 40 Mbps to up to 1 Gbps. Swisscom's internet speeds include 40 Mbps to 100 Mbps on its VDSL network and up to 1 Gbps in areas served by its FTTx network. Swisscom continues to expand its FTTx network

to Switzerland households in our footprint, as well as in our partner network footprints. It has built its FTTx network in several cities in cooperation with municipality-owned utility companies and, where no cooperation agreement has been reached, Swisscom is building its own FTTx network. With respect to subscribers on the partner networks, UPC Switzerland competes with other service providers for the contracts to serve these subscribers. Sunrise and Salt also compete in this arena, with a focus on offering promotions and other value propositions. In this competitive market, UPC Switzerland increased its introductory speed to 50 Mbps and is promoting its broadband services through its bundled offers.

Video Distribution

Our video services compete primarily with traditional FTA broadcast television services, DTH satellite service providers and other fixed-line telecommunications carriers and broadband providers, including incumbent telephony operations offering (1) DTH satellite services, (2) IPTV over broadband internet connections using asymmetric DSL or VDSL or an enhancement to VDSL called "vectoring", (3) IPTV over FTTx networks or (4) LTE Services. Many of these competitors have a national footprint and offer features, pricing and video services individually and in bundles comparable to what we offer. In certain markets, we also compete with other cable providers who have overbuilt portions of our systems. Mobile broadband has gained a noticeable share of video subscribers, which is another competitive factor.

OTT video content aggregators utilizing our or our competitors' high-speed internet connections are also a significant competitive factor, as are other video service providers that overlap our service areas. The OTT video aggregators (such as HBO Now, Amazon Prime Video, Netflix, Disney+ and AppleTV+) offer VoD service for television series and movies, catch-up television and programming from broadcasters. Generally, the content libraries of such services are offered for a monthly fee. Typically these services are available on multiple devices in and out of the home. In some cases, OTT services are provided free-of-charge. To enhance our competitive position, we provide our subscribers with TV everywhere products and premium OTT video services through our online mobile apps, VoD and Replay TV services or our arrangements with Netflix and Amazon. Our businesses also compete to varying degrees with other sources of information and entertainment, such as online entertainment, newspapers, magazines, books, live entertainment/concerts and sporting events.

Our ability to continue to attract and retain customers depends on our continued ability to acquire appealing content and services on acceptable terms and to have such content available on multiple devices and outside the home. Some competitors have obtained long-term exclusive contracts for certain programming, which limits the opportunities for other providers to offer such programs. Other competitors also have obtained long-term exclusive contracts for programs, but our operations have limited access to certain of such programming through select contracts with these companies, including Sky and BT in the U.K. and Ireland. If exclusive content offerings increase through other providers, programming options could be a deciding factor for subscribers on selecting a video service.

Similar to our technological advances to enhance our video services, our competitors are also improving their video platforms with next generation set-top boxes, TV everywhere products and other interactive services. Similarly, VDSL, which is either provided directly by the owner of the network or by a third-party, is a significant part of the competitive environment in many of our markets, as are FTTx networks. In all of our markets, competitive video services are offered by the incumbent telecommunications operator, whose video strategies include IPTV over DSL, VDSL and FTTx networks and, in some cases, DTH and DTT. The ability of incumbent operators to offer the triple-play of broadband internet, video and fixed-line telephony services and, in most countries, a quad-play with mobile services, is exerting competitive pressure on our operations, including the pricing and bundling of our video products. In order to gain video market share, the incumbent operators and alternative service providers in a number of our larger markets are pricing their DTT, IPTV or DTH video packages at a discount to the retail price of the comparable digital cable service.

In our Poland and Slovakia broadband markets, we face intense competition from DTH services. These DTH companies offer aggressively-priced packages of video content and in some cases offer triple-play packages. FTA broadcasters are also significant competitors in these markets. Our cable operations stay competitive by offering enhanced digital services, such as HD channel offerings, Horizon Go and expanded VoD services. Our operations have also increased broadband internet speeds in their triple-play bundles to up to 1 Gbps in parts of Poland and Slovakia. Promotional discounts are available, particularly on bundled options.

We compete on value by offering advanced digital services, such as DVR functionality, HD, VoD, catch-up television, Replay TV, online mobile apps and multiscreen services and multimedia gateways. We also compete by offering advanced digital features and attractive content packages, as well as bundled services, at reasonable prices. In each of the countries in which we operate, we also tailor our packages to include attractive channel offerings and offer recurring discounts for bundled services and loyalty contracts. In addition, from time to time, we modify our digital channel offerings to improve the quality of our programming. Where mobile voice and data are available, we focus on our converged service offerings at attractive prices. In our other operations,

we use the triple-play bundle as a means of driving video, as well as other products where convenience and price can be leveraged across the portfolio of services. We also continue to enhance our Horizon TV product to meet our customers' desire to view programming anytime and anywhere, such as new applications and expanding its availability in our markets.

- Virgin Media. Virgin Media's digital television services compete primarily with FTA television and with Sky, the primary pay satellite television provider. Sky offers competitively priced triple-play and quad-play services in the U.K. and Ireland. Other significant competitors are BT and TalkTalk Telecom Group plc (**TalkTalk**) in the U.K. and Eircom Limited in Ireland, each of which offer triple-play services, as well as IPTV video services. Each of these competitors have multimedia home gateways.

Sky owns the U.K. rights to various entertainment, sports and movie programming content and channels. Sky is both a principal competitor in the pay-television market and an important supplier of content to us. Various Sky channels, including *Sky Sports*, are available over Sky's satellite system and our cable networks, as well as via Sky's apps and online players and other television platforms, and some of the channels are available on BT and TalkTalk platforms. Virgin Media distributes several basic and premium video channels supplied by Sky. BT is also both a principal competitor and an important supplier of content to us. BT owns premium BT Sport channels, providing a range of sports content, including football (soccer) from the English Premier League and exclusive rights to the UEFA Champions League and the UEFA Europa League. The BT Sport channels are available on our cable network as well as our competitors' networks.

In this competitive market, Virgin Media is expanding its broadband network and promotes its 4K enabled Virgin Media V6 set-top box in the U.K. In Ireland it offers Horizon TV and its functionalities (marketed as "Virgin TV"). The on-line streaming service Virgin TV Go is available throughout the Virgin Media footprint. Virgin Media customers also have access to third-party apps (e.g. Netflix, Amazon Prime Video, YouTube and Starz). In addition, Virgin Media's ability to include mobile for its U.K. and Ireland customers for a low incremental fee creating a fixed-mobile convergence bundle is a key market offer.

- Telenet. Telenet's principal competitor is Proximus, the incumbent telecommunications operator, which has interactive digital television, replay television, VoD and HD service as part of its video offer, as well as a remote access service. Proximus offers customers a wide range of both individual and bundled services at competitive prices. Also, Telenet and other Belgian cable operators must give alternative providers access to their cable networks. Orange Belgium N.V. (**Orange Belgium**) gained such access in 2016 and currently offers its mobile subscribers a dual play bundle, including enhanced video and broadband internet services. Telenet may face increased competition from other providers of video services who take advantage of the wholesale access and may be able to offer triple- and quad-play services. For more information on wholesale access, see *Regulatory Matters—Belgium*.

In order to compete effectively against alternative providers, Telenet leverages its extensive cable network, the broad acceptance of its basic cable television services and Yelo Play and its additional features, such as HD and DVR functionality, VoD offerings, its *Play Sports* channel and original programming (e.g. *Chaussée d'Amour* and *De Dag*). Telenet is able to offer international, national, regional and local content, including Dutch-language broadcasts, to its subscribers. It is also using mobile services to drive its other products through its converged offerings. In addition, Telenet continues to enhance its Yelo Play app and programming and the addition of sports rights.

- UPC Switzerland. Our main competitor in Switzerland is Swisscom, the incumbent telecommunications operator, which provides IPTV services over DSL, VDSL and FTTx networks. Swisscom offers VoD services, DVR and replay functionality and HD channels, as well as the functionality to allow remote access to its video services, and has exclusive rights to distribute certain sports programming. Sunrise is also a significant competitor, offering a full suite of fixed and mobile connectivity as well as entertainment offers. Although its presence is limited, Salt focuses on value propositions by including TV within their bundles. In this saturated market, price competition and high promotional intensity are significant factors. To compete effectively in Switzerland, UPC Switzerland is promoting Horizon 4 (marketed as "UPC TV"), as well as Horizon TV, and related family of products together with Replay TV and VoD, giving subscribers the ability to personalize their programming and viewing preferences. UPC Switzerland also has its own exclusive sports channel, *My Sports*, and aggregates third-party apps (e.g. Netflix and YouTube). UPC Switzerland also uses its high-speed internet service with speeds of up to 1 Gbps to promote its extended digital tier bundles and offer mobile services.

Mobile and Telephony Services

Consumers are increasingly moving to mobile services. In Belgium, as a mobile network operator, we are one of the larger mobile providers based on number of SIM cards. We also have a growing mobile business in Switzerland and in the U.K. through MVNO arrangements. In our other European markets, however, we currently have minimal mobile presence. In the markets where we are a large mobile provider, we continue to seek additional bandwidth to deliver our wide range of services to our customers and increase our LTE services. Where we are a small mobile provider, we face significant competition from other mobile telephony providers, many of whom offer LTE services and are making significant advances in obtaining customers. In all of our markets competition is intense. We offer various calling plans, such as unlimited network, national or international calling, unlimited off-peak calling and minute packages, including calls to fixed and mobile phones. In addition, we use our bundled offers with our video and ultra high-speed internet services to gain mobile subscribers. Our ability to offer fixed-mobile convergence services is a key driver. In several of our markets we provide converged services, including mobile, fixed-line, broadband and video. We are also exploring opportunities to offer mobile services in our other markets and mobility applications to our other services.

The market for fixed-line telephony services is mature in almost all of our markets. Changes in market share are driven by the combination of price and quality of services provided and the inclusion of telephony services in bundled offerings. Our fixed-line telephony services compete against the incumbent telecommunications operator in the applicable market. In these markets, the operators have substantially more experience in providing fixed-line telephony and mobile services, greater resources to devote to the provision of fixed-line telephony services and long-standing customer relationships. In all of our markets, we also compete with other VoIP operators offering service across broadband lines. OTT telephony is also a competitive factor. In addition, our businesses face competition from other cable telephony providers, FTTx-based providers or other indirect access providers.

Competition in both the residential and business fixed-line telephony markets is extremely competitive due to market trends, the offering of carrier pre-select services, number portability, the replacement of fixed-line with mobile telephony and the growth of VoIP services, as well as continued deregulation of telephony markets and general price competition. Carrier pre-select services allow the end user to choose the voice services of operators other than the incumbent while using the incumbent's network. Our fixed-line telephony strategy is focused around value leadership, and we position our services as "anytime" or "any destination". Our portfolio of calling plans include a variety of innovative calling options designed to meet the needs of our subscribers. In many of our markets, we provide product innovation, such as telephone apps that allow customers to make and receive calls from their fixed-line call packages on smart phones. In addition, we offer varying plans to meet customer needs and, similar to our mobile services, we use our telephony bundle options with our digital video and internet services to help promote our telephony services and flat rate offers are standard.

The incumbent telecommunication companies remain our key competitors but mobile operators and other VoIP operators, including ISPs, offering service across broadband lines are also significant competitors in these markets. Due to the maturity of the telephony market, competition is particularly intense in all of our markets with price often the deciding factor. To maintain or increase market share, we and our competitors focus on bundling telephony services with quality broadband offerings and other services. In each of our markets, we face competition with a dominant fixed-line telephony provider, most of which also have competitive mobile offers based on LTE services. In our largest markets, the key dominant telephony providers are BT (U.K.), Proximus (Belgium) and Swisscom (Switzerland). These telephony competitors are also the largest mobile operators in these markets based on number of SIM cards. These competitors include their mobile products in bundles with fixed-line services. Generally, we expect telephony markets to remain extremely competitive.

Regulatory Matters

Overview

Video distribution, broadband internet, fixed-line telephony and mobile businesses are regulated in each of the countries in which we operate. The scope of regulation varies from country to country, although in some significant respects regulation in European markets is harmonized under the regulatory structure of the European Union (E.U.).

Adverse regulatory developments could subject our businesses to a number of risks. Regulation, including conditions imposed on us by competition or other authorities as a requirement to close acquisitions or dispositions, could limit growth, revenue and the number and type of services offered and could lead to increased operating costs and property and equipment additions. In addition, regulation may restrict our operations and subject them to further competitive pressure, including pricing restrictions, interconnect and other access obligations, and restrictions or controls on content, including content provided by third parties. Failure to comply with current or future regulation could expose our businesses to various penalties.

Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden are the Member States of the E.U. as of February 1, 2020. As such, these countries are required to harmonize certain laws with E.U. rules by transposing directives into their national law. In addition, other types of E.U. rules (or regulations) are directly enforceable in those countries without any implementation at the national level. Certain E.U. rules are also applicable across the European Economic Area, whose Member States are the E.U. Member States (excluding Croatia) as well as Iceland, Liechtenstein and Norway as of February 1, 2020.

On June 23, 2016, the U.K. held a referendum in which U.K. citizens voted in favor of, on an advisory basis, an exit from the E.U. commonly referred to as “Brexit”. The U.K. formally left the E.U. on January 31, 2020, and has now entered into a transition period until December 31, 2020, during which the U.K. and the E.U. will negotiate to formalize the future U.K.-E.U. relationship with respect to a number of matters, most notably trade. Although the U.K. has ceased to be an E.U. member, during the transition period their trading relationship will remain the same and the U.K. will continue to follow the E.U.’s rules, such as accepting rulings from the European Court of Justice, and the U.K. will continue to contribute to the E.U.’s budget. It is possible that the U.K. will fail to agree to specific separation terms with the E.U. by the end of the transition period, which, absent extension, may require the U.K. to leave the E.U. under a so-called “hard Brexit” or “no-deal Brexit” without specific agreements on trade, finance and other key elements. The foregoing has caused uncertainty as to Brexit’s impact on the free movement of goods, services, people and capital between the U.K. and the E.U., customer behavior, economic conditions, interest rates, currency exchange rates, and availability of capital. The effects of Brexit could adversely affect our business, results of operations and financial condition, as more fully detailed in *Item 1A. Risk Factors* included in Part I of this Annual Report on Form 10-K. There can be no assurance that the U.K. will continue to follow E.U. rules to the end of the transition period nor that future U.K. policy in this area will remain as favorable to our company as is currently the case. The U.K. government has confirmed that it will transpose such regulation as though the U.K. remained a member of the E.U. (i.e. full implementation). If, however, no Brexit deal is approved by the end of the transition period, the U.K. Government has indicated that it will implement only the parts that support its policy objectives.

In the broadcasting and communications sectors, there has been extensive E.U.-level legislative action. As a result, most of the markets in Europe in which our businesses operate have been significantly affected by the E.U. regulatory framework. Regulation in Switzerland, which is not a Member State of the E.U. and is not part of the European Economic Area, is discussed separately below, as well as regulations in certain Member States in which we face regulatory issues that may have a material impact on our business.

On May 6, 2015, the European Commission published its Digital Single Market strategy document. The strategy is an aggregation of many different policy areas with the purpose of creating a digital single market to expand jobs and stimulate growth. The strategy includes policy review in the areas of E.U. communications regulation, broadcasting law, copyright reform and anti-competitive geo-blocking practices. The majority of these policy reviews were completed by year-end 2019 and the impacts are discussed below.

E.U. Communications Regulation

The E.U. law that is the primary source of communications regulation in the European Union is the European Electronic Communications Code (**the Code**). The Code came into effect on December 20, 2018, as part of the Digital Single Market strategy and must be transposed into national law by December 21, 2020. Until then, its predecessor, the “**Regulatory Framework**”, will continue to apply. Although many of the rules under the Regulatory Framework have been included in the Code, there are significant changes required to be implemented by Member States.

The Code, similar to the Regulatory Framework, primarily seeks to develop open markets for communication services within Europe. It harmonizes the rules within the E.U. for the establishment and operation of electronic communication networks, including cable television and traditional telephony networks, and the offer of electronic communication services, such as telephony (including OTT services), internet and, to some degree, television services. The Code also includes a number of provisions aimed at providing incentives to boost private sector investment in very high capacity networks and stimulating the harmonization of spectrum licensing to encourage investment in mobile networks, with the intent to result in more advanced services. The Code does not generally address content matters, including radio and television programming, which are specifically regulated by the Audiovisual Media Services Directive (as defined and described below).

Set forth below are certain key provisions included in the Code. This description is not intended to be a comprehensive or exhaustive description of all regulation in this area.

- **Licensing and Exclusivity.** The Code, similar to the Regulatory Framework, requires Member States to abolish exclusivities on communication networks and services in their territory and allow operators into their markets based on

a simple registration. The Code sets forth an exhaustive list of conditions that may be imposed on communication networks and services. Possible obligations include, among other things, financial charges for universal service or for the costs of regulation, environmental requirements, data privacy and other consumer protection rules, “must carry” obligations, provision of customer information to law enforcement agencies and access obligations.

- Significant Market Power. Specific obligations allowed by the Code, similar to the Regulatory Framework, apply only to operators or service providers with Significant Market Power (defined below) in a relevant market. For example, the provisions of the Code allow the National Regulatory Authority (NRA) in E.U. Member States to mandate certain access obligations only for those operators and service providers that are deemed to have Significant Market Power. For purposes of the Code, an operator or service provider will be deemed to have “Significant Market Power” where, either individually or jointly with others, it enjoys a position of significant economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and consumers.

As part of the implementation of certain provisions of the Code, each Member State’s NRA is required to analyze certain markets predefined by the European Commission to determine if any operator or service provider has Significant Market Power. The European Commission has currently recommended that there be four such predefined markets, which are subject to periodic review (with the next review expected in 2020). NRAs may, however, perform analysis of markets not listed in the recommendation, which requires the NRA to prove that additional requirements, the so called three-criteria test, are met.

NRAs might seek to define us as having Significant Market Power, single or jointly with another provider, in any of these predefined markets or they may define and analyze additional markets. In the event that we are found to have Significant Market Power in any particular market, an NRA could impose certain conditions on us. Under the Code, the European Commission has the power to veto a finding by an NRA of Significant Market Power (or the absence thereof), which power also applies with respect to market definition, in any market, regardless of whether it is a market predefined by the European Commission or an additional market defined by an NRA. The European Commission does not, however, have the power to veto any remedies, such as access obligations, imposed as a result of a finding of Significant Market Power. We have been found to have Significant Market Power in certain markets in which we operate and further findings of Significant Market Power are possible.

- Video Services. The regulation of distribution, but not the content, of television services to the public is harmonized by the Code. Member States are allowed to impose on certain operators under their jurisdiction reasonable must carry obligations for the transmission of specified radio and television broadcast channels. Such obligations are required to be based on clearly defined general interest objectives, be proportionate and be transparent and subject to periodic review. We are subject to must carry regulations in all markets in which we operate. Must carry regulations are different among Member States. We do not expect the European Commission or the Member States to curtail such obligations in the foreseeable future.
- Net Neutrality/Traffic Management/Roaming. In October 2015, the European Parliament adopted the regulation on the first E.U.-wide net neutrality regime. The regulation, which is directly applicable in all Member States, permits the provision of specialized services, optimized for specific content and subjects operators to reasonable traffic management requirements. The regulation also abolished retail roaming tariffs beginning in June 2017 and introduced wholesale roaming price caps. In 2019, the E.U. also introduced caps on wholesale rates for intra-E.U. calls (i.e. calls from the users’ Member State of residence to another Member State) to bring these in line with the wholesale roaming caps.

Broadcasting Law

Although the distribution of video channels by a cable operator is within the scope of the Code, the activities of a broadcaster are harmonized by other elements of E.U. law, in particular the Audiovisual Media Services Directive (**AVMS**). The AVMS was revised and reissued December 18, 2018 under the Digital Single Market strategy. E.U. Member States must implement the revised AVMS into national law by September 19, 2020. The country of origin principle and linear TV European works quota have been maintained in the revised AVMS.

Generally, broadcasts originating in and intended for reception within an E.U. Member State must respect the laws of that Member State. Pursuant to the AVMS, however, E.U. Member States are required to allow broadcast signals of broadcasters established in another E.U. Member State to be freely transmitted within their territory, so long as the broadcaster complies with the law of their home state. This is referred to as the country of origin principle. Under the AVMS, the country of origin principle applies also to non-linear services, such as VoD. Accordingly, we could offer our own VoD services across the European Economic Area based on the regulation of the country of origin. As a result, we could have a single regulatory regime for all of our VoD services offered in Europe. In addition, when we offer third-party VoD services on our network, it is the business of the third-party provider of the services, and not us as the distributor, that is regulated in respect of these services.

The AVMS established quotas for the transmission of European-produced programming and programs made by European producers who are independent of broadcasters. The revised AVMS extended these quotas to both linear and non-linear services. Under the AVMS, the providers of these services, including our operations, may be required to contribute financially to the European producers of the programming.

The AVMS also allows Member States to require media service providers, both broadcasters and distributors, in their jurisdiction to contribute financially to the production of European works. The revised AVMS extended this to enable Member States to require financial contributions from VoD providers established in other territories that targets audiences in their jurisdiction. Such obligations are applicable to (or are expected to become applicable to) certain of our businesses.

According to the regulation of the European Commission addressing the portability of online audiovisual content services, commercial providers of online content services (including OTT service providers) are required to enable subscribers who are temporarily present in any Member State with access and use of online content services in substantially the same manner as in the Member State of residence. Our services comply with these portability requirements.

Copyright Law

In April 2019, the European Commission adopted a new directive relating to satellite and cable retransmissions as part of its Digital Single Market strategy. The directive introduces a new country of origin principle in relation to online content, extends the existing copyright clearance system to other technologies (such as satellite, mobile and IPTV) and extends a similar rights clearance system to directly injected cable channels. Member States are required to transpose the majority of this directive into national law by June 2021.

Other European Level Regulation

In addition to the industry-specific regimes discussed above, our operating companies must comply with both specific and general legislation concerning, among other matters, data retention and electronic commerce. In May 2018, the General Data Protection Regulation (**GDPR**) with respect to data protection and retention became effective in the E.U. The GDPR sets strict standards regarding the handling, use and retention of personal data. Organizations that fail to comply face stiff penalties. As required, our operations have implemented various measures internally and with third-party vendors to meet these requirements. In addition, in January 2017, the European Commission published a proposal for a new e-Privacy regulation, replacing the current e-Privacy Directive that regulates privacy related issues in the electronic communications sector. Negotiations among E.U. Member States are still in process on this proposal.

Our operating companies are also subject to both national and European level regulations on competition and on consumer protection, which are broadly harmonized at the E.U. level. For example, while our operating companies may offer their services in bundled packages in European markets, they are sometimes not permitted to make a subscription to one service, such as cable television, conditional upon a subscription to another service, such as telephony. They may also face restrictions on the degree to which they may discount certain products included in the bundled packages.

The European Commission is imposing additional mandatory requirements and encouraging voluntary solutions regarding energy consumption of the telecommunications equipment we provide our customers. We have been participating in discussions and studies regarding energy consumption with the European Commission and with experts working on their behalf. In addition, we are working with suppliers of our digital set-top boxes to lower power consumption, as well as looking at possibilities through

software to lower the power consumption of the existing fleet of digital set-top boxes. We have also worked with a large group of companies to create a voluntary agreement on set-top box power consumption as an alternative to regulation, which has been formally recognized by the European Commission. Nevertheless, legislation in this area may be adopted that could adversely affect the cost and/or the functionality of equipment we deploy to customers.

Pursuant to an E.U. Regulation on standby power (the **Standby Regulation**), many devices are required to have either a low power standby mode or off mode, unless it is inappropriate to have either such mode on the device. Furthermore, the Standby Regulation regulates, among others, the maximum power consumption of networked consumer equipment while in the so-called “Networked Standby” mode. As a result, all of the devices we purchase and/or develop, including Horizon TV and Horizon 4 set-top boxes, Connect Boxes, cable modems and certain other equipment, operate under the power management requirements of the Standby Regulation and are subject to audit to ensure compliance.

As part of the E.U.’s Radio Spectrum Policy Program, spectrum made available through the switch off of analog television has been approved for mobile broadband. This spectrum, known as the “digital dividend”, is in the 700 - 862 MHz band. The terms under which this spectrum becomes available varies among the European countries in which we operate. Certain uses of this spectrum may interfere with services carried on our cable networks. If this occurs, we may need to: (1) avoid using certain frequencies on our cable networks for certain or all of our services, (2) make some changes to our networks, or (3) change the equipment that we deploy. In approving mobile broadband, however, the Radio Spectrum Policy Program states that the new mobile services must co-exist with existing services, such as cable and DTT, to avoid harmful interference. As a result, we are in ongoing discussions with relevant Member States and the European Commission to be included in LTE mobile trials in order to develop mitigation techniques and to engage NRAs to launch regulatory dialog with equipment manufacturers and mobile operators to develop co-existing networks.

Also, the Radio Equipment Directive, which has been transposed into national legislation by E.U. Member States, establishes a regulatory framework for placing radio equipment on the market. Its objective is a single market for radio equipment by setting essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It also provides the basis for further regulation governing some additional aspects, including technical features for the protection of privacy, personal data and fraud, interoperability, access to emergency services, and compliance regarding the combination of radio equipment and software. It also takes into account of the need for improved market surveillance; in particular, for the traceability obligations of manufacturers, importers and distributors. As a result, all of the devices we purchase and/or develop, including Horizon TV and Horizon 4 set-top boxes, Connect Boxes, cable modems, which contain radio interfaces (such as WiFi) and certain other equipment, must operate under these rules.

There is a Mutual Recognition Agreement established between the E.U. and Switzerland for the purpose of mutual recognition of conformity assessment of regulated products. As a result, the Standby Regulation and the Radio Equipment Directive are also applicable in Switzerland.

With respect to cybersecurity, the E.U. adopted a directive on security of network and information systems (**NIS Directive**), which provides legal measures to boost the overall level of cybersecurity in the E.U., namely with respect to operators of “essential services.” In principle, our operations within the E.U. do not fall under the NIS Directive as it exempts providers of Electronic Communications Services, which are governed by the E.U. telecommunications framework. Some national transpositions of the NIS Directive (for example, the Netherlands and Ireland) and national definitions of essential services, however, could fall under specific NIS Directive obligations. As a result, our network and communication equipment must be compliant with these obligations. To date, of our consolidated operating companies, only Virgin Media Ireland has been identified as falling under these obligations or being categorized as essential services. In the Netherlands, the VodafoneZiggo JV has been identified as an operator of essential telecommunication facilities due to its customer base of over one million subscribers. See—*Netherlands* below.

United Kingdom

In the U.K., the Regulatory Framework is implemented through (1) the Communications Act 2003, which regulates all forms of communications technology, whether used for telecommunications or broadcasting, and (2) the Wireless Telegraphy Act 2006, which regulates radio communications in the U.K. (including spectrum, licensing arrangements, usage conditions and charges, license bidding and trading and enforcement and penalties). In addition, the Privacy and Electronic Communications Regulations 2003, as amended, implemented E.U. Directive 2002/58, which regulates the processing of personal data and the protection of privacy in the electronic communications sector.

Telecommunications companies in the U.K., including Virgin Media, are also subject to regulation under the U.K. Broadcasting Acts 1990 and 1996 and other U.K. statutes and subordinate legislation, including the Competition Act 1998, the Enterprise Act 2002 and the Enterprise and Regulatory Reform Act 2013. The U.K. Office of Communications (**Oftcom**) regulates both linear and on-demand programming, with regulatory requirements derived from the AVMS Directive.

Ofcom is the key regulatory authority for the communications sector in which Virgin Media operates in the U.K. It is responsible for furthering the interests of citizens in relation to communications matters and furthering the interests of consumers in relevant markets where appropriate by promoting competition. Ofcom is also responsible for regulating the BBC, a role previously undertaken by the BBC Trust. The U.K. Competition and Markets Authority has jurisdiction with respect to competition matters.

End of Contract Notifications. Ofcom has recently issued new regulatory requirements originating from the European Electronic Communications Code, that, effective in February 2020, obligate providers to (i) alert customers who are approaching the end of a minimum contract term to the fact that their contract period is coming to an end and to set out the best new price that the provider can offer them and (ii) once a year, alert customers who are out of contract to that fact and again confirm the best new price the provider can offer them. In both cases, providers must also set out the price available to new customers for an equivalent service offering. These requirements could have a material adverse impact on our revenue and Adjusted OIBDA in 2020 and future periods.

Broadband Expansion. At the end of 2019, super-fast broadband was available to more than 95% of U.K. premises. To stimulate private investment in this endeavor, the U.K. government has been using money from the publicly funded BBC license fee, underspend from the Analogue TV Switch-Off Project and other sources of public investment. The state aid measure permitting this subsidy was renewed (and amended) in 2016 and is expected, through amendments to its “underspend” provisions, to result in up to an additional 1% to 2% super-fast coverage, making it available to 97%-98% of the population by the end of 2020.

The U.K. government also supports the market rollout of full fiber and 5G services. Such support includes public funding for the creation of a match-funded “full fiber deployment” fund, business rate relief for the deployment of new full fiber networks and public funding for a strategic program of full fiber and 5G trials. As a result, the U.K. government’s November 2017 budget included £190.0 million (\$252.0 million) for the first and second phases of its local full fiber deployment fund and £160.0 million (\$212.2 million) for the first phase of the 5G trials. In the second half of 2019, the U.K. government set out its ambition for all premises to have access to a gigabit capable service by the end of 2025. To facilitate this, it announced £5 billion (\$7 billion) of public funding for areas that are not commercially viable. Further detail on this funding, together with a State aid application, are expected to follow in early 2020.

The Telecommunications Infrastructure Bill received Royal Assent in February 2018, which gives effect to the U.K. government’s plans to provide full business rate relief for new fiber infrastructure built during the 2017-2022 rating period. Secondary legislation followed in April 2018, clarifying that the relief also applies to new lite fiber and any plant and machinery used to build the infrastructure. In addition, the U.K. government published its Telecoms Infrastructure Review in July 2018. This Review explored whether the conditions for investment in fiber are optimal in the U.K. and what policy changes should be considered to encourage greater investment in new digital infrastructure. The Government concluded that, with the right policy support, infrastructure based competition will deliver FTTP/Gbit capable networks to approximately 90% of U.K. premises. To facilitate this, the U.K. government intends to introduce a notification regime for multiple dwelling unit wayleaves, introduce a requirement for new housing developments to have FTTP access and increase consistency in street works and duct access. To this end, following consultation, the Telecommunications Infrastructure (Leasehold Property) Bill was presented to parliament in October 2019 and is expected to be passed in the summer of 2020. Draft legislation requiring new housing developments to have FTTP access is expected to be presented to parliament in the first half of 2020. In the Queen’s speech following the U.K.’s general election in December 2019, the U.K. government set out its intention to conduct a fundamental review of business rates. The details of the review are expected to be announced in early 2020. During the course of 2019, the U.K. government also issued a Statement of Strategic Priorities to Ofcom, emphasizing the importance of promoting investment as key to achieving the U.K.’s connectivity ambitions.

In November 2015, the U.K. government announced that everyone will, beginning in March 2020, have a legal right to request a broadband connection of at least 10 Mbps regardless of where they live. The government intends to achieve this by introducing a broadband Universal Service Obligation (USO). The USO is aimed, in particular, at addressing the final 5% of the population in the U.K. without access to a broadband connection of a reasonable speed. The U.K. government introduced legislation in July 2017, to facilitate the introduction of a broadband USO. At the same time, BT made an alternative offer to invest approximately £600.0 million (\$795.8 million) to provide ubiquitous minimum broadband speeds of 10 Mbps by 2022. The U.K. government formally rejected BT’s proposal in December 2017, favoring the imposition of a regulated USO. The U.K. government set out the design for the USO in secondary legislation in March 2018. Ofcom has responsibility for implementation (including designation of the Universal Service Providers (USPs) and deciding whether a USO constitutes an “unfair burden” on the USPs and, if so, designing an industry funding mechanism to compensate the USPs). In December 2018, Ofcom issued a consultation on its proposed designation of BT and KCOM Group PLC as the USPs. Ofcom consulted on its approach to assessing any unfair burden claims as well as determining which operators would be required to contribute to a universal service industry fund in late 2019. Ofcom proposed that the USPs would be able to request a review of potential compensation claims for any efficiently incurred ‘unfair net cost burden’ once per year, for Ofcom to assess. If Ofcom accepts the request for a review, it would consider whether it is fair

for the USP to bear some or all of the burden, as well as consider the cost to Ofcom and the industry of establishing and administering an industry fund. The net burden would be assessed based on the incremental cost of delivering the USO, less the benefits associated with being the USP. Ofcom intends to determine which operators would contribute to the fund and how much they would contribute at a later date. Ofcom has also indicated the USPs cannot make this request any earlier than March 2021. In the meantime, the number of consumers who would be eligible for the universal service is expected to decline, as providers continue to upgrade and expand their networks.

Television and VoD Services. In the U.K., Virgin Media is required to hold individual licenses under the Broadcasting Acts 1990 and 1996 for any television channels (including Barker channels), which Virgin Media owns or operates and for the provision of certain other services on its cable television platform, such as electronic program guides. These television licensable content service (TLCS) licenses are granted and administered by Ofcom. Under these licenses, each covered service must comply with a number of Ofcom codes, including the Broadcasting Code, and with all directions issued by Ofcom. Breach of any of the terms of a TLCS license may result in the imposition of fines on the license holder and, ultimately, the license being revoked.

As a provider of an on-demand program service (ODPS), Virgin Media must comply with a number of statutory obligations in relation to “editorial content” and notify Ofcom of its intention to provide an ODPS. Failure to notify Ofcom or comply with the relevant statutory obligations may result in the imposition of fines or, ultimately, the prohibition on providing an ODPS.

Regulation of Broadband Markets. In March 2018, Ofcom completed its latest review of the Wholesale Local Access market (incorporating physical or passive network access via methods such as LLU and duct access). Ofcom found that BT continues to hold Significant Market Power and imposed corresponding remedies on it until April 2021. These remedies include price controls on “virtual” access to its wholesale 40/10Mbps FTTx product, the maintenance of access and pricing controls on its wholesale copper products and improvements to the existing physical infrastructure access product (third-party access to BT’s duct and pole estate).

Future Approach to Regulation. In July 2018, Ofcom published a Strategic Policy Position, setting out its intended future approach to regulation from April 2021 (aimed at creating regulatory certainty to support investment in full fiber broadband). It includes an intention to take a more holistic consideration of business and residential markets (ultimately combining previously separate markets) and to consider different regulatory approaches in different parts of the country, reflecting the varying levels of network competition. In January 2020, Ofcom published the provisional conclusions from its holistic review of the residential broadband and business connectivity markets, setting out its intended approach to regulating them (to apply for a five year period beginning in April 2021). It proposes to categorize areas of the country and apply regulation depending on the level of competition in those areas. In both non-competitive areas (~30% of premises) and in potentially competitive areas (~70% of premises), BT Openreach will continue to be required to provide wholesale access to its network; however, in the latter such wholesale access will be limited to BT Openreach’s entry-level superfast broadband service. Although Ofcom has not identified any competitive areas at this stage, once it does so, all regulation will be lifted from those areas.

Ofcom intends to regulate BT Openreach’s wholesale business connections (or “leased lines”) in a similar way to residential broadband by varying its approach geographically to reflect the level of current or prospective competition and increasing charges in line with inflation.

Ofcom Review of Business Connectivity Markets. Ofcom published the conclusions of its last review of the business connectivity (leased lines) market in the third quarter of 2019. The review maintained the existing approach, to market definition, (flat) price caps for some wholesale BT services and a narrow dark fibre remedy on BT (in areas where infrastructure competition is non-existent and unlikely to occur). It also introduced an extension of the duct and pole remedy applying to BT to enable its use for (standalone) business grade services. Ofcom published its latest review of the business connectivity market in January 2020, as part of the broader, holistic review of the connectivity markets (see above under *Future Approach to Regulation*).

Mobile Service. As an MVNO, Virgin Media is subject to E.U. regulations relating to retail prices for roaming services. These regulations: set limits on certain wholesale and retail tariffs for international mobile voice roaming, SMS tariffs and data roaming within the E.U.; provide for greater levels of transparency of retail pricing information; impose measures to guard against bill shock in respect of data roaming; and set maximum roaming rates within the E.U. Effective June 2017, the E.U. abolished roaming tariffs.

Mobile termination charges applied by mobile network operators are regulated by Ofcom under a Significant Market Power charge control condition. Under Virgin Media’s MVNO agreement, these changes in mobile termination charges are passed on to Virgin Media. Ofcom has set mobile termination charges for the period of 2018-2021, with rates reducing by approximately 5% from their starting levels by the end of this period.

Fixed Voice Termination. Virgin Media has been designated as a provider with Significant Market Power on fixed voice termination. As a result, the rates it charges other providers for termination on its network are subject to regulation. This requires, among other things, the provision of termination on fair and reasonable terms, conditions and charges, which must be no higher than BT's regulated charges, unless certain conditions are met.

Belgium

Belgium has broadly transposed the Regulatory Framework into law. The Belgisch Instituut voor Post en Telecommunicatie (the **BIPT**), the Belgian NRA, has determined that Telenet is an operator with Significant Market Power in the market for call termination on an individual fixed public telephone network. Reciprocal termination rates have been imposed, which results in Telenet charging the interconnection rate of the incumbent telecommunications operator, Proximus. BIPT has confirmed a wholesale tariff of €0.116 (\$0.13) per minute, which is currently in effect.

BIPT has adopted a bottom-up long run incremental cost model to calculate tariffs for call termination on individual mobile networks, resulting in a nominal value of €0.99 (\$1.11) per minute, which is currently in effect. BIPT has also designated Telenet, as a mobile network operator, as having Significant Market Power in the market for "call termination on individual networks."

In 2011, BIPT and the regional regulators for the media sectors (together, the **Belgium Regulatory Authorities**) found Telenet to have Significant Market Power in the broadcasting market (the **2011 Decision**). The 2011 Decision imposed on Telenet an obligation to provide third-party operators, at specified "retail minus" tariff rates, with (1) a resale offer of an analog television package, (2) access to digital television platforms and (3) a resale offer of broadband internet access in combination with the digital television access obligation.

In 2018 the Belgium Regulatory Authorities adopted a market review decision (the **2018 Decision**), which replaced the 2011 Decision. The 2018 Decision replaces the 2011 Decision. The 2018 Decision finds that Telenet has Significant Market Power in the wholesale broadband market. The obligations include (1) providing third-party operators with access to the digital television platform (including basic digital video and analog video) and (2) making available to third-party operators a bitstream offer of broadband internet access (including fixed voice as an option). Telenet considered the 2018 Decision to be inconsistent with the principle of technology-neutral regulation and the European Single Market Strategy to stimulate further investments in broadband networks. Telenet filed an appeal with the Brussels Markets Court that was rejected on September 4, 2019.

The 2018 Decision no longer applies a retail minus pricing on Telenet. Instead, it imposes a 17% reduction in monthly wholesale cable resale access prices during an interim period before setting "reasonable access tariffs". These tariffs are expected to be implemented in Q1 2020 with a link to cable cost model that is under development by the Belgium Regulatory Authorities. On July 5, 2019, the Belgium Regulatory Authorities published for consultation a draft decision regarding "reasonable access tariffs" that will replace the interim prices. As applicable to Telenet, the proposed tariffs represent an estimated additional 25% reduction compared to the interim prices. Telenet provided substantive comments in September 2019. The next step for the Belgium Regulatory Authorities is to notify a final draft decision to the European Commission. Ahead of the notification, Telenet submitted its comments to the European Commission, opposing the "reasonable access tariffs." The Belgium Regulatory Authorities had indicated their intention to adopt a final decision in Q4 2019, with the application of new tariffs in early 2020, however, the notification to the European Commission still needs to be made, which will trigger the review process by the European Commission.

The 2018 Decision aims to, and in its application, may strengthen Telenet's competitors by granting them resale access to Telenet's network to offer competing products and services notwithstanding Telenet's substantial historical financial outlays in developing the infrastructure. In addition, any resale access granted to competitors could (1) limit the bandwidth available to Telenet to provide new or expanded products and services to the customers served by its network and (2) adversely impact Telenet's ability to maintain or increase its revenue and cash flows. The extent of any such adverse impacts ultimately will be dependent on the extent that competitors take advantage of the resale access afforded to Telenet's network, the rates that Telenet receives for such access and other competitive factors or market developments.

Switzerland

Switzerland has a regulatory system that partially reflects the principles of the E.U., but otherwise is distinct from the European regulatory system of telecommunications. The Telecommunications Act (*Fernmeldegesetz*) regulates, in general, the transmission of information, including the transmission of radio and television signals. Most aspects of the distribution of radio and television, however, are regulated under the Radio and Television Act (*Bundesgesetz über Radio und Fernsehen*). In addition, the Competition Act, the Data Protection Act and the Act on the Surveillance of Post and Telecommunications are potentially relevant to our business. With respect to energy consumption of electronic home devices, the Energy Act and the Energy Ordinance are applicable to set-top boxes and modems.

Under the Telecommunications Act, any provider of telecommunication services must register with the Federal Office of Communications. Dominant providers must grant access to their network to third parties, including LLU access; however, it is restricted to the copper wire network of the incumbent, Swisscom. Therefore, such unbundling obligations do not apply to our business in Switzerland and other cable operators. Also, any dominant provider must grant access to its ducts, subject to sufficient capacity being available in the relevant duct. At this time, only Swisscom has been determined to be dominant in this regard. Dominant operators are obliged to provide interconnection and all providers of services forming part of the universal service in Switzerland have to ensure interoperability of services.

In regards to call termination as part of interconnection agreements, Swisscom as market dominant provider, must offer these services at cost-oriented prices and disclose the conditions and prices for their individual access services. In interconnection agreements with Swisscom, reciprocal termination rates are imposed.

In spring 2019, the revised Telecommunications Act was passed. Changes include more extensive consumer and youth protection measures (such as decreasing roaming fees, measures to prevent spoofing). In terms of net neutrality, it foresees more transparency for the customer—he/she must be informed if traffic is treated unequally and traffic management measures are only allowed under certain very restrictive circumstances (e.g. to fight exceptional network congestion). In December 2019, pursuant to the Telecommunications Act, the corresponding ordinances were published. Public consultation is currently ongoing until the end of March 2020. The revised Telecommunications Act and the corresponding ordinances are not expected to be in effect and binding before 2021.

Under the Radio and Television Act and the corresponding ordinance, cable network operators are obliged to distribute certain programs that contribute in a particular manner to media diversity. The Federal Government and the Federal Office of Communications can select up to 25 programs that have to be distributed without the cable operator being entitled to compensation.

In September 2016, the Intelligence Agencies Act was approved by the Swiss population and became effective in September 2017. For Telecommunications service providers, the Intelligence Agencies Act set forth new obligations regulating cable traffic.

A revised version of the Data Protection Act foresees more transparency regarding the processing of data and follows the developments in the E.U. The Swiss Parliament decided that the revised version would be implemented in two phases. For phase one, only mandatory alignments with E.U. rules were implemented. For phase two, the parliamentary phase is still ongoing. It is anticipated that the revised act will mostly reflect the GDPR in European countries.

The Netherlands

The Netherlands' electronic communications law broadly implements the Regulatory Framework. Pursuant to the electronic communications law, the Autoriteit Consument & Markt (**ACM**), the Netherlands NRA, performed a market analysis to determine which, if any, operator or service provider has Significant Market Power. In December 2011, ACM completed its analysis of the television market and concluded that there were no grounds for regulation of that market. As a result, no new regulations relating to the television market may be proposed without a new analysis. Similar to our other operations, the VodafoneZiggo JV is subject to must carry obligations, including a number of regional and local broadcasting channels, as well as public broadcasting channels.

On August 5, 2013, ACM published a market analysis decision on call termination, which combines both the fixed termination market and the mobile termination market. Following various administrative actions, which resulted in the Dutch Supreme Administrative Court upholding the ACM decision in July 2017. The implementation of the new tariff under the ACM market analysis decision on call termination became effective on July 12, 2017, and will apply until July 12, 2020. The VodafoneZiggo JV appealed ACM's market decision. In September 2018, the appeal court delivered a verdict against ACM's market decision. The verdict provides guidance sought by the VodafoneZiggo JV on the interpretation and setting of interconnection tariffs among operators.

In July 2015, the Dutch incumbent telecommunications operator KPN filed an appeal against the European Commission regarding its decision to approve the acquisition of Ziggo, which we completed in November 2014. In October 2017, the European General Court ruled that the European Commission did not state sufficient reasons for not analyzing the possible vertical anti-competitive effects on the market for premium pay TV sports channels; thereby annulling the European Commission's clearance of the Ziggo acquisition. The E.U. Merger Regulation provides in such a case that the transaction be re-examined by the European Commission with a view of adopting a new decision. As a result, we filed a formal re-notification of the Ziggo acquisition with the European Commission. In May 2018, the European Commission again cleared the acquisition. In November 2018, KPN appealed the new European Commission's clearance of Ziggo/UPC on grounds similar to last time. VodafoneZiggo JV submitted a Statement in Intervention in June 2019. We expect an oral hearing to be held in 2020.

KPN also filed a court challenge against the European Commission's 2016 decision that approved the VodafoneZiggo JV transaction. KPN is seeking annulment of the 2016 decision. Oral hearings took place in November 2018. On May 23, 2019, the Court rejected KPN's appeal.

On February 27, 2018, the ACM published a draft decision of its analysis of the LLU market, concluding that there is a single market for local and central access. ACM referred to this market as the Wholesale Fixed Access market and concluded that KPN and the VodafoneZiggo JV had joint Significant Market Power. As a result, ACM imposed on the VodafoneZiggo JV an obligation to offer wholesale cable access and continued wholesale cable access regulation of KPN. Following a market consultation, ACM submitted the draft decision to the European Commission. After comments by the European Commission, ACM published the final decision on September 28, 2018, which became effective on October 1, 2018. The VodafoneZiggo JV published a draft Reference Offer on December 31, 2018 and published tariffs on March 31, 2019. The VodafoneZiggo JV only has to invest in the implementation of cable access if there is actual demand (i.e. a signed contract with an access seeker). The VodafoneZiggo JV has appealed ACM's decision before the national court and initiated an action before the European General Court. A ruling in the national appeal is expected in Q1 2020.

On November 9, 2018, the implementation of the NIS Directive by the Netherlands entered into force. In general, providers of electronic communication services are not in scope of the NIS Directive. The legislator for the Netherlands, however, decided to apply, to a certain extent, the NIS Directive on providers of electronic communication services. As a result, the VodafoneZiggo JV must notify the Netherlands Telecoms Agency and the National Cyber Security Center when a cybersecurity incident occurs, as well as the Netherlands Data Protection Authority if a data breach occurs.

Employees

As of December 31, 2019, we, including our consolidated subsidiaries, had an aggregate of approximately 20,200 full-time equivalent employees, certain of whom belong to organized unions and works councils, and excludes contractors and temporary employees.

Available Information

All our filings with the U.S. Securities and Exchange Commission (the SEC), including our Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K, as well as amendments to such filings are available on our internet website free of charge generally within 24 hours after we file such material with the SEC. Our website address is www.libertyglobal.com. The information on our website is not part of this Annual Report and is not incorporated by reference herein.

Item 1A. RISK FACTORS

In addition to the other information contained in this Annual Report, you should consider the following risk factors in evaluating our results of operations, financial condition, business and operations or an investment in the shares of our company.

The risk factors described in this section have been separated into four groups:

- risks that relate to the competition we face and the technology used in our businesses;
- risks that relate to our operating in overseas markets and being subject to foreign regulation;
- risks that relate to certain financial matters;
and
- other risks, including risks that, among other things, relate to the obstacles that may be faced by anyone who may seek to acquire us.

Although we describe below and elsewhere in this Annual Report the risks we consider to be the most material, there may be other unknown or unpredictable economic, business, competitive, regulatory or other factors that also could have material adverse effects on our results of operations, financial condition, business or operations in the future. In addition, past financial performance may not be a reliable indicator of future performance and historical trends should not be used to anticipate results or trends in future periods.

If any of the events described below, individually or in combination, were to occur, our businesses, prospects, financial condition, results of operations and/or cash flows could be materially adversely affected.

Factors Relating to Competition and Technology

We operate in increasingly competitive markets, and there is a risk that we will not be able to effectively compete with other service providers. The markets for cable television, broadband internet, telephony and mobile services are highly competitive. In the provision of video services, we face competition from FTA and DTT broadcasters, video provided via satellite platforms, networks using DSL, VDSL or vectoring technology, multi-channel multipoint distribution system operators, FTTx networks, OTT video content aggregators, and, in some countries where parts of our systems are overbuilt, cable networks, among others. Our operating businesses are facing increasing competition from video services provided by, or over the networks of, incumbent telecommunications operators and other service providers. As the availability and speed of broadband internet increases, we also face competition from OTT video content providers utilizing our or our competitors' high-speed internet connections. In the provision of telephony and broadband internet services, we are experiencing increasing competition from the incumbent telecommunications operators and other service providers in each country in which we operate, as well as mobile providers of voice and data. The incumbent telecommunications operators typically dominate the market for these services and have the advantage of nationwide networks and greater resources than we have to devote to the provision of these services. Many of the incumbent operators offer double-play, triple-play and quadruple-play bundles of services. In many countries, we also compete with other operators using LLU to provide these services, other facilities-based operators and wireless providers. Developments in the DSL and other technology used by the incumbent telecommunications operators and alternative providers have improved the attractiveness of our competitors' products and services and strengthened their competitive position. Developments in wireless technologies, such as LTE and WiFi, are creating additional competitive challenges.

In some of our markets, national and local government agencies may seek to become involved, either directly or indirectly, in the establishment of FTTx networks, DTT systems or other communications systems. We intend to pursue available options to restrict such involvement or to ensure that such involvement is on commercially reasonable terms. There can be no assurance, however, that we will be successful in these pursuits. As a result, we may face competition from entities not requiring a normal commercial return on their investments. In addition, we may face more vigorous competition than would have been the case if there were no government involvement.

We expect the level and intensity of competition to continue to increase from both existing competitors and new market entrants as a result of changes in the regulatory framework of the industries in which we operate, advances in technology, the influx of new market entrants and strategic alliances and cooperative relationships among industry participants. Increased competition could result in increased customer churn, reductions of customer acquisition rates for some products and services and significant price and promotional competition in our markets. In combination with difficult economic environments, these competitive pressures could adversely impact our ability to increase or, in certain cases, maintain the revenue, average revenue per RGU or mobile subscriber, as applicable (ARPU), RGUs, mobile subscribers, adjusted operating income before depreciation and amortization (**Adjusted OIBDA**), Adjusted OIBDA margins and liquidity of our operating segments.

Changes in technology may limit the competitiveness of and demand for our services. Technology in the video, telecommunications and data services industries is changing rapidly, including advances in current technologies and the emergence of new technologies. New technologies, products and services may impact consumer behavior and therefore demand for our products and services. The ability to anticipate changes in technology and consumer tastes and to develop and introduce new and enhanced products and services on a timely basis will affect our ability to continue to grow, increase our revenue and number of subscribers and remain competitive. New products and services, once marketed, may not meet consumer expectations or demand, can be subject to delays in development and may fail to operate as intended. A lack of market acceptance of new products and services that we may offer, or the development of significant competitive products or services by others, could have a material adverse impact on our revenue and Adjusted OIBDA.

Our significant property and equipment additions, namely in connection with our Network Extensions, may not generate a positive return. Significant additions to our property and equipment are, or in the future may be, required to add customers to our networks and to upgrade or expand our broadband communications networks and upgrade customer premises equipment to enhance our service offerings and improve the customer experience. Additions to our property and equipment, which are currently underway, including in connection with our Network Extensions, require significant capital expenditures for equipment and associated labor costs to build out and/or upgrade our networks as well as for related customer premises equipment. Additionally, significant competition, the introduction of new technologies, the expansion of existing technologies, such as FTTx and advanced DSL technologies, the impact of natural disasters, or adverse regulatory developments could cause us to decide to undertake previously unplanned builds or upgrades of our networks and customer premises equipment.

No assurance can be given that any rebuilds, upgrades or extensions of our network (including the Network Extensions) will increase penetration rates, increase average monthly subscription revenue per average cable RGU or mobile subscriber, as applicable, or otherwise generate positive returns as anticipated, or that we will have adequate capital available to finance such rebuilds, upgrades or extensions. Additionally, costs related to our Network Extensions and property and equipment additions

could end up being greater than originally anticipated or planned. If this is the case, we may require additional financing sooner than anticipated or we may have to delay or abandon some or all of our development and expansion plans or otherwise forego market opportunities. Additional financing may not be available on favorable terms, if at all, and our ability to incur additional debt will be limited by our debt agreements. If we are unable to, or elect not to, pay for costs associated with adding new customers, expanding, extending or upgrading our networks or making our other planned or unplanned additions to our property and equipment, or are delayed in making such investments, our growth could be limited and our competitive position could be harmed.

We depend almost exclusively on our relationships with third-party programming providers and broadcasters for programming content, and a failure to acquire a wide selection of popular programming on acceptable terms could adversely affect our business. The success of our video subscription business depends, in large part, on our ability to provide a wide selection of popular programming to our subscribers. We generally do not produce our own content and we depend on our agreements, relationships and cooperation with public and private broadcasters and collective rights associations to obtain such content. If we fail to obtain a diverse array of popular programming for our pay television services, including a sufficient selection of HD channels as well as non-linear content (such as a selection of attractive VoD content and rights for ancillary services such as DVR and catch up or 'Replay' services), on satisfactory terms, we may not be able to offer a compelling video product to our customers at a price they are willing to pay. Additionally, we are frequently negotiating and renegotiating programming agreements and our annual costs for programming can vary. There can be no assurance that we will be able to renegotiate or renew the terms of our programming agreements on acceptable terms or at all. Programming and copyright costs represent a significant portion of our operating costs and are subject to rise in future periods due to various factors, including (1) higher costs associated with the expansion of our digital video content, including rights associated with ancillary product offerings and rights that provide for the broadcast of live sporting events and (2) rate increases.

If we are unable to obtain or retain attractively priced competitive content, demand for our existing and future video services could decrease, thereby limiting our ability to attract new customers, maintain existing customers and/or migrate customers from lower-tier programming to higher-tier programming, thereby inhibiting our ability to execute our business plans. Furthermore, we may be placed at a competitive disadvantage if certain of our competitors obtain exclusive programming rights, particularly with respect to popular sports and movie programming, and as certain entrants in the OTT market, for example Netflix, Amazon and even Disney, increasingly produce their own exclusive content.

We depend on third-party suppliers and licensors to supply necessary equipment, software and certain services required for our businesses. We rely on third-party vendors for the equipment, software and services that we require in order to provide services to our customers. Our suppliers often conduct business worldwide and their ability to meet our needs is subject to various risks, including political and economic instability, natural calamities, interruptions in transportation systems, terrorism and labor issues. As a result, we may not be able to obtain the equipment, software and services required for our businesses on a timely basis or on satisfactory terms. Any shortfall in customer premises equipment could lead to delays in completing extensions to our networks and in connecting customers to our services and, accordingly, could adversely impact our ability to maintain or increase our RGUs, revenue and cash flows. Also, if demand exceeds the suppliers' and licensors' capacity or if they experience financial difficulties, the ability of our businesses to provide some services may be materially adversely affected, which in turn could affect our businesses' ability to attract and retain customers. Although we actively monitor the creditworthiness of our key third-party suppliers and licensors, the financial failure of a key third-party supplier or licensor could disrupt our operations and have an adverse impact on our revenue and cash flows. We rely upon intellectual property that is owned or licensed by us to use various technologies, conduct our operations and sell our products and services. Legal challenges could be made against our use of our or our licensed intellectual property rights (such as trademarks, patents and trade secrets) and we may be required to enter into licensing arrangements on unfavorable terms, incur monetary damages or be enjoined from use of the intellectual property rights in question.

Certain of our businesses that offer mobile telephony and data services rely on the radio access networks of third-party wireless network providers to carry our mobile communications traffic. Our services to mobile customers in many jurisdictions in which we operate rely on the use of MVNO arrangements in which we utilize the radio access networks of third-party wireless network providers to carry our mobile communications traffic. If any of our MVNO arrangements are terminated, or if the respective third-party wireless network provider fails to provide the services required under an MVNO arrangement, or if a third-party wireless network provider fails to deploy and maintain its network, and we are unable to find a replacement network operator on a timely and commercially reasonable basis or at all, we could be prevented from continuing the mobile services relying on such MVNO arrangement. Additionally, as our MVNO arrangements come to term, we may not be able to renegotiate renewal or replacement MVNO arrangements on the same or more favorable terms.

Failure in our or third-party technology or telecommunications systems, leakage of sensitive customer data, or security breaches could significantly disrupt our operations, reduce our customer base and result in fines, litigation or lost revenue. Our success depends, in part, on the continued and uninterrupted performance of our information technology and network systems,

including internet sites, data hosting and processing facilities and other hardware, software and technical applications and platforms, as well as our customer service centers. Some of these are managed, hosted, provided or used by third-party service providers or their vendors, to assist in conducting our business. In addition, the hardware supporting a large number of critical systems for our cable network in a particular country or geographic region is housed in a relatively small number of locations. Our and our third-party service providers' systems and equipment (including our routers and set-top boxes) are vulnerable to damage or security breach from a variety of sources, including telecommunications failures, power loss, malicious human acts, security flaws, and natural disasters. Moreover, despite security measures, unauthorized parties may gain access to or disrupt our or our third-party service providers' servers, systems and equipment by, among other things, hacking into our servers, systems and equipment or those of our third-party service providers through fraud, computer viruses, worms, phishing, physical or electronic break-ins or burglaries, or errors by our or our third-party service providers' employees. We and our third-party service providers may not be able to anticipate or respond in an adequate and timely manner to attempts to obtain authorized access to, disable or degrade our or our third-party service providers' systems because the techniques for doing so change frequently, are increasingly complex and sophisticated and are difficult to detect for periods of time. In addition, as discussed further below, the security measures and procedures we and our third-party service providers have in place to protect personal data and other information may not be sufficient to counter all data security breaches, cyber-attacks, or system failures. In some cases, mitigation efforts may depend on third parties who may not deliver products or services that meet the required contractual standards or whose hardware, software or network services may be subject to error, defect, delay, or outage.

Through our operations, sales and marketing activities, we collect and store certain personal information related to our customers. This may include phone numbers, drivers license numbers, contact preferences, personal information stored on electronic devices, and payment information, including credit and debit card data. We also gather and retain information about employees in the normal course of business. In certain circumstances, where it is lawful to do so, we may share information about such persons with third-party service providers that assist with certain aspects of our business. Unauthorized parties may attempt to gain access to such data and information using the same methods described in the prior paragraph. As a result, data and information we gather could be subject to misappropriation, misuse, leakage, falsification or accidental release or loss of information maintained in our information technology systems and networks and those of our third-party service providers, including customer and personnel data. As a result of the increasing awareness concerning the importance of safeguarding personal information, the potential misuse of such information and legislation that has been adopted or is being considered across all of our markets regarding the protection, privacy and security of personal information, information-related risks are increasing, particularly for businesses like ours that handle a large amount of personal data. Failure to comply with these data protection laws may result in, among other consequences, fines, litigation or regulatory actions by state, federal or non-U.S. authorities.

Despite the precautions we have taken, unanticipated problems affecting our systems and equipment could cause business disruptions such as failures in our information technology systems, disruption in the transmission of signals over our networks, unauthorized access to the data and information we gather or similar problems. Further, although we devote significant resources to our cybersecurity programs and have implemented security measures to protect our systems and data, and to prevent, detect and respond to data security incidents, there can be no assurance that our efforts will prevent these threats. Any disruptive situation that causes loss, misappropriation, misuse or leakage of data could damage our reputation and the credibility of our operations, and could subject us to potential liability, including litigation or other legal actions against us, the imposition of penalties, fines, fees or liabilities, which may not be covered by our insurance policies, and lost customers and revenue. While we maintain cyber liability insurance that provides both third-party liability and first-party liability insurance coverage, such insurance may not be sufficient to protect against all of our businesses' losses from any future disruptions or breaches of their systems or other events as described above. Also, a cybersecurity breach and the changing cybersecurity landscape could require us to devote significant management resources to address the problems associated with the breach and to expend significant additional resources to upgrade further the security measures we employ to protect customer, employee, or other personal information against cyber-attacks and other wrongful attempts to access such information, which could result in a disruption of our operations. This includes additional infrastructure capacity spending to mitigate any system degradation and the reallocation of resources from development activities.

The "Virgin" brand is used by our subsidiary Virgin Media under licenses from Virgin Enterprises Limited and is not under the control of Virgin Media. The activities of the group of companies utilizing the "Virgin" brand and other licensees could have a material adverse effect on the goodwill of customers towards Virgin Media as a licensee and the licenses from Virgin Enterprises Limited can be terminated in certain circumstances. The "Virgin" brand is integral to Virgin Media's corporate identity. Virgin Media is reliant on the general goodwill of consumers towards the Virgin brand. Consequently, adverse publicity in relation to the group of companies utilizing the "Virgin" brand or its principals, particularly Sir Richard Branson, who is closely associated with the brand, or in relation to another licensee of the "Virgin" name and logo (particularly in the U.K., where Virgin Media does business) could have a material adverse effect on Virgin Media's reputation and on Virgin Media's and our business and results of operations. In addition, the licenses from Virgin Enterprises Limited can be terminated in certain circumstances. For example, Virgin Enterprises Limited can terminate the licenses, after providing Virgin Media with an opportunity to cure, (1) if Virgin Media or any of its affiliates commits persistent and material breaches or a flagrant and material breach of the licenses,

(2) if Virgin Enterprises Limited has reasonable grounds to believe that the use (or lack of use) of the licensed trademarks by Virgin Media has been or is likely to result in a long-term and material diminution in the value of the “Virgin” brand, or (3) if a third-party who is not (or one of whose directors is not) a “fit and proper person”, such as a legally disqualified director or a bankrupt entity, acquires “control” of Liberty Global. Such a termination could have a material adverse effect on Virgin Media’s and our business and results of operations.

Factors Relating to Overseas Operations and Foreign Regulation

Our businesses are conducted almost exclusively outside of the U.S., which gives rise to numerous operational risks. Our businesses operate almost exclusively in countries outside the U.S. and are thereby subject to the following inherent risks:

- fluctuations in foreign currency exchange rates;
- difficulties in staffing and managing international operations;
- potentially adverse tax consequences;
- export and import restrictions, custom duties, tariffs and other trade barriers;
- increases in taxes and governmental fees;
- economic and political instability; and
- changes in foreign and domestic laws and policies that govern operations of foreign-based companies.

Operational risks that we may experience in certain countries include disruptions of services or loss of property or equipment that are critical to overseas businesses due to expropriation, nationalization, war, insurrection, terrorism or general social or political unrest.

We are exposed to foreign currency exchange rate risk. We are exposed to foreign currency exchange rate risk with respect to our consolidated debt in situations where our debt is denominated in a currency other than the functional currency of the operations whose cash flows support our ability to repay or refinance such debt. Although we generally seek to match the denomination of our and our subsidiaries’ borrowings with the functional currency of the operations that are supporting the respective borrowings, market conditions or other factors may cause us to enter into borrowing arrangements that are not denominated in the functional currency of the underlying operations (unmatched debt). In these cases, our policy is to provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2019, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations.

In addition to the exposure that results from the mismatch of our borrowings and underlying functional currencies, we are exposed to foreign currency risk to the extent that we enter into transactions denominated in currencies other than our or our subsidiaries’ respective functional currencies (non-functional currency risk), such as equipment purchases, programming contracts, notes payable and notes receivable (including intercompany amounts). Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these items will result in unrealized (based upon period-end exchange rates) or realized foreign currency transaction gains and losses upon settlement of the transactions. Moreover, to the extent that our revenue, costs and expenses are denominated in currencies other than our respective functional currencies, we will experience fluctuations in our revenue, costs and expenses solely as a result of changes in foreign currency exchange rates. Generally, we will consider hedging non-functional currency risks when the risks arise from agreements with third parties that involve the future payment or receipt of cash or other monetary items to the extent that we can reasonably predict the timing and amount of such payments or receipts and the payments or receipts are not otherwise hedged. In this regard, we have entered into foreign currency forward contracts to hedge certain of these risks. For additional information concerning our foreign currency forward contracts, see note 8 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We also are exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of foreign currency translation. Our primary exposure to foreign currency translation risk during the three months ended December 31, 2019 was to

the British pound sterling and euro as 53.0% and 32.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling and euro, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for the Swiss franc and other local currencies in Europe. We do not hedge against the risk that we may incur non-cash losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars.

Our businesses are subject to risks of adverse regulation. Our businesses are subject to the unique regulatory regimes of the countries in which they operate. Video distribution, broadband internet, telephony and mobile businesses are subject to licensing or registration eligibility rules and regulations, which vary by country. The provision of electronic communications networks and services requires our licensing from, or registration with, the appropriate regulatory authorities and, for telephony services, entrance into interconnection arrangements with other phone companies, including the incumbent phone company. It is possible that countries in which we operate may adopt laws and regulations regarding electronic commerce, which could dampen the growth of the internet services being offered and developed by these businesses. In a number of countries, our ability to increase the prices we charge for our cable television service or make changes to the programming packages we offer is limited by regulation or conditions imposed by competition authorities or is subject to review by regulatory authorities or is subject to termination rights of customers. In addition, regulatory authorities may grant new licenses to third parties and, in any event, in most of our markets new entry is possible without a license, although there may be registration eligibility rules and regulations, resulting in greater competition in territories where our businesses may already be active. More significantly, regulatory authorities may require us to grant third parties access to our bandwidth, frequency capacity, facilities or services to distribute their own services or resell our services to end customers. Consequently, our businesses must adapt their ownership and organizational structure as well as their pricing and service offerings to satisfy the rules and regulations to which they are subject. A failure to comply with applicable rules and regulations could result in penalties, restrictions on our business or loss of required licenses or other adverse conditions.

Adverse changes in rules and regulations could:

- impair our ability to use our bandwidth in ways that would generate maximum revenue and Adjusted OIBDA;
- create a shortage of capacity on our networks, which could limit the types and variety of services we seek to provide our customers;
- impact our ability to access spectrum for our mobile services;
- strengthen our competitors by granting them access and lowering their costs to enter into our markets; and
- have a significant adverse impact on our results of operations.

Businesses, including ours, that offer multiple services, such as video distribution as well as internet, telephony, and/or mobile services, or that are vertically integrated and offer both video distribution and programming content, often face close regulatory scrutiny from competition authorities in several countries in which they operate. This is particularly the case with respect to any proposed business combinations, which will often require clearance from national competition authorities. The regulatory authorities in several countries in which we do business have considered from time to time what access rights, if any, should be afforded to third parties for use of existing cable television networks and have imposed access obligations in certain countries. This has resulted, for example, in obligations with respect to call termination for our telephony business in Europe, video must carry obligations in many markets in which we operate and video and broadband internet access obligations in Belgium.

When we acquire additional communications companies, these acquisitions may require the approval of governmental authorities (either at country or, in the case of the E.U., European level), which can block, impose conditions on, or delay an acquisition, thus hampering our opportunities for growth. In the event conditions are imposed and we fail to meet them in a timely manner, the governmental authority may impose fines and, if in connection with a merger transaction, may require restorative measures, such as mandatory disposition of assets or divestiture of operations.

For information regarding certain other regulatory developments that could adversely impact our results of operations in future periods, see *Legal and Regulatory Proceedings and Other Contingencies - Other Regulatory Matters* in note 19 to our consolidated financial statements.

New legislation may significantly alter the regulatory regimes applicable to us, which could adversely affect our competitive position and profitability, and we may become subject to more extensive regulation if we are deemed to possess significant market power in any of the markets in which we operate. Significant changes to the existing regulatory regimes applicable to the provision of cable television, telephony, internet and mobile services have been and are still being introduced. For example, in the E.U. a large element of regulation affecting our business derives from a number of Directives that are the basis of the

regulatory regimes concerning many of the services we offer across the E.U. The various Directives require Member States to harmonize their laws on communications and cover issues such as access, user rights, privacy and competition. These Directives are reviewed by the E.U. from time to time and any changes to them could lead to substantial changes in the way in which our businesses are regulated and to which we would have to adapt. In addition, we are subject to review by competition or national regulatory authorities in certain countries concerning whether we exhibit Significant Market Power. A finding of Significant Market Power can result in our company becoming subject to pricing, open access, unbundling and other requirements that could provide a more favorable operating environment for existing and potential competitors.

The U.K.'s departure from the E.U. could have a material adverse effect on our business, financial condition, results of operations or liquidity. On June 23, 2016, the U.K. held a referendum in which voters approved, on an advisory basis, an exit from the E.U., commonly referred to as "Brexit". The U.K. formally exited the E.U. on January 31, 2020, and has now entered into a transition period until December 31, 2020, during which the U.K. and the E.U. will negotiate to formalize the future U.K.-E.U. relationship with respect to a number of matters, most notably, trade. Although the U.K. has ceased to be an E.U. member, during the transition period their trading relationship will remain the same and the U.K. will continue to follow the E.U.'s rules, such as accepting rulings from the European Court of Justice, and the U.K. will continue to contribute to the E.U.'s budget. Uncertainty remains as to what specific terms of separation may be agreed during the transition period. It is possible that the U.K. will fail to agree to specific separation terms with the E.U. by the end of the transition period, which, absent extension, may require the U.K. to leave the E.U. under a so-called "hard Brexit" or "no-deal Brexit" without specific agreements on trade, finance and other key elements. The foregoing has caused uncertainty as to Brexit's impact on the free movement of goods, services, people and capital between the U.K. and the E.U., customer behavior, economic conditions, interest rates, currency exchange rates, and availability of capital. Examples of the potential impact Brexit could have on our business, financial condition or results of operations include:

- changes in foreign currency exchange rates and disruptions in the capital markets. For example, a sustained period of weakness in the British pound sterling or the euro could have an adverse impact on our liquidity, including our ability to fund repurchases of our equity securities and other U.S. dollar-denominated liquidity requirements;
- shortages of labor necessary to conduct our business, including our Network Extensions in the U.K.;
- disruption to our U.K. supply chain and related increased cost of supplies;
- a weakened U.K. economy resulting in decreased consumer demand for our products and services in the U.K.;
- legal uncertainty and potentially divergent national laws and regulations as the U.K. determines which E.U. laws and directives to replace or replicate, or where previously implemented by enactment of U.K. laws or regulations, to retain, amend or repeal; and
- various geopolitical forces may impact the global economy and our business, including, for example, other E.U. member states (in particular those member states where we have operations) proposing referendums to, or electing to, exit the E.U.

We cannot be certain that we will be successful with respect to acquisitions, dispositions, partnerships or other similar transactions, or that we will achieve the anticipated benefits thereof. Historically, our businesses have grown, in part, through selective acquisitions that enabled them to take advantage of existing networks, local service offerings and region-specific management expertise, and we have also taken advantage of attractive opportunities to sell select businesses. We expect to seek to continue improving our company through attractive acquisitions, dispositions, partnerships or other similar transactions in selected markets, such as the SFR BeLux acquisition in June 2017, the De Vijver Media acquisition in June 2019, the UPC Austria disposition in July 2018 and the sales of the operations of UPC DTH and the Vodafone Disposal Group in May 2019 and July 2019, respectively. Our ability to complete any transaction may be limited by many factors, including government regulation, availability of financing, our or our counterparty's debt covenants, the prevalence of complex ownership structures among potential targets, acquirers, or partners, disapproval by shareholders of potential targets or acquirers, and competition from other potential acquirers, including private equity funds. Even if we are successful in completing such transactions, integration and separation activities may present significant costs and challenges. We cannot be assured that we will be successful with respect to acquisitions, dispositions, partnerships or other similar transactions or realizing the anticipated benefits thereof. For example, we had agreed to the sale of UPC Switzerland. However, in November 2019, the related Share Purchase Agreement was terminated due to a dispute between the proposed acquirer and its largest shareholder.

In addition, we anticipate that most, if not all, companies acquired by us will be located outside the U.S. Foreign companies may not have disclosure controls and procedures or internal controls over financial reporting that are as thorough or effective as those required by U.S. securities laws. While we intend to conduct appropriate due diligence and to implement appropriate controls

and procedures as we integrate acquired companies, we may not be able to certify as to the effectiveness of these companies' disclosure controls and procedures or internal controls over financial reporting until we have fully integrated them.

We may have exposure to additional tax liabilities. We are subject to income taxes as well as non-income based taxes, such as value added tax (VAT) in the U.K., the U.S. and many other jurisdictions around the world. In addition, most tax jurisdictions that we operate in have complex and subjective rules regarding the valuation of intercompany services, cross-border payments between affiliated companies and the related effects on income tax, VAT and transfer tax. Significant judgment is required in determining our worldwide provision for income taxes and other tax liabilities. In the ordinary course of our business, there are many transactions and calculations where the ultimate tax determination is uncertain. We are regularly under audit by tax authorities in many of the jurisdictions in which we operate. Although we believe that our tax estimates are reasonable, any material differences as a result of final determinations of tax audits or tax disputes could have an adverse effect on our financial position and results of operations in the period or periods for which determination is made.

We are subject to changing tax laws, treaties and regulations in and between countries in which we operate, including treaties between and among the U.K., the U.S. and many other jurisdictions in which we have a presence. Also, various income tax proposals in the jurisdictions in which we operate could result in changes to the existing laws on which our deferred taxes are calculated. A change in these tax laws, treaties or regulations, or in the interpretation thereof, could result in a materially higher income or non-income tax expense, and any such material changes could cause a material change in our effective tax rate. In this regard, there have been significant changes or proposed changes to the tax laws in numerous jurisdictions in which we operate, the impacts of which have been reflected accordingly in our financial statements.

Further changes in the tax laws of the foreign jurisdictions in which we operate could arise as a result of the base erosion and profit shifting project that has been undertaken by the OECD or the European Commission Anti-Tax Avoidance Package. The OECD, which represents a coalition of member countries that encompass most of the jurisdictions in which we operate, and the European Commission have undertaken studies and are publishing action plans that include recommendations aimed at addressing what they believe are issues within tax systems that may lead to tax avoidance by companies. It is possible that jurisdictions in which we do business could react to these initiatives or their own concerns by enacting tax legislation that could adversely affect us or our shareholders through increasing our tax liabilities.

Factors Relating to Certain Financial Matters

Our substantial leverage could limit our ability to obtain additional financing and have other adverse effects. We seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk. In this regard, we generally seek to cause our operating subsidiaries to maintain their debt at levels that result in a consolidated debt balance that is between four and five times our consolidated Adjusted OIBDA. As a result, we are highly leveraged. At December 31, 2019, the outstanding principal amount of our consolidated debt, together with our finance lease obligations aggregated \$28.3 billion, including \$3.9 billion that is classified as current on our consolidated balance sheet and \$20.7 billion that is not due until 2025 or thereafter. We believe that we have sufficient resources to repay or refinance the current portion of our debt and finance lease obligations and to fund our foreseeable liquidity requirements during the next 12 months. However, as our maturing debt grows in later years, we anticipate that we will seek to refinance or otherwise extend our debt maturities. In this regard, we completed refinancing transactions during 2019 that, among other things, resulted in the extension of certain of our subsidiaries' debt maturities. No assurance can be given that we will be able to complete these refinancing transactions or otherwise extend our debt maturities. In this regard, it is not possible to predict how political and economic conditions, sovereign debt concerns or any adverse regulatory developments could impact the credit and equity markets we access and, accordingly, our future liquidity and financial position.

Our ability to service or refinance our debt and to maintain compliance with the leverage covenants in the credit agreements and indentures of our borrowing groups is dependent primarily on our ability to maintain or increase the Adjusted OIBDA of our operating subsidiaries and to achieve adequate returns on our property and equipment additions and acquisitions. In addition, our ability to obtain additional debt financing is limited by the incurrence-based leverage covenants contained in the various debt instruments of our borrowing groups. For example, if the Adjusted OIBDA of one of our borrowing groups were to decline, our ability to obtain additional debt could be limited. Accordingly, if our cash provided by operations declines or we encounter other material liquidity requirements, we may be required to seek additional debt or equity financing in order to meet our debt obligations and other liquidity requirements as they come due. In addition, our current debt levels may limit our ability to incur additional debt financing to fund working capital needs, acquisitions, property and equipment additions, or other general corporate requirements. We can give no assurance that any additional debt or equity financing will be available on terms that are as favorable as the terms of our existing debt or at all. Further, our board of directors has approved share repurchase programs for Liberty Global. Any cash used by our company in connection with any future purchases of our ordinary shares would not be available for other purposes, including the repayment of debt. For additional information concerning our share repurchase programs, see note 14 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Certain of our subsidiaries are subject to various debt instruments that contain restrictions on how we finance our operations and operate our businesses, which could impede our ability to engage in beneficial transactions. Certain of our subsidiaries are subject to significant financial and operating restrictions contained in outstanding credit agreements, indentures and similar instruments of indebtedness. These restrictions will affect, and in some cases significantly limit or prohibit, among other things, the ability of those subsidiaries to:

- incur or guarantee additional indebtedness;
- pay dividends or make other upstream distributions;
- make investments;
- transfer, sell or dispose of certain assets, including subsidiary stock;
- merge or consolidate with other entities;
- engage in transactions with us or other affiliates; or
- create liens on their assets.

As a result of restrictions contained in these debt instruments, the companies party thereto, and their subsidiaries, could be unable to obtain additional capital in the future to:

- fund property and equipment additions or acquisitions that could improve their value;
- meet their loan and capital commitments to their business affiliates;
- invest in companies in which they would otherwise invest;
- fund any operating losses or future development of their business affiliates;
- obtain lower borrowing costs that are available from secured lenders or engage in advantageous transactions that monetize their assets; or
- conduct other necessary or prudent corporate activities.

In addition, most of the credit agreements to which these subsidiaries are parties include financial covenants that require them, in certain circumstances, to maintain certain leverage ratios if the drawings under the applicable revolving credit facility exceed a certain percentage of the commitments under such revolving credit facility. Their ability to meet these financial covenants may be affected by adverse economic, competitive, or regulatory developments and other events beyond their control, and we cannot assure you that these financial covenants will be met. In the event of a default under such subsidiaries' credit agreements or indentures, the lenders may accelerate the maturity of the indebtedness under those agreements or indentures, which could result in a default under other outstanding credit facilities or indentures. We cannot assure you that any of these subsidiaries will have sufficient assets to pay indebtedness outstanding under their credit agreements and indentures. Any refinancing of this indebtedness is likely to contain similar restrictive covenants.

We are exposed to interest rate risks. Shifts in such rates may adversely affect the debt service obligation of our subsidiaries. We are exposed to the risk of fluctuations in interest rates, primarily through the credit facilities of certain of our subsidiaries, which are indexed to EURIBOR, LIBOR or other base rates. Although we enter into various derivative transactions to manage exposure to movements in interest rates, there can be no assurance that we will be able to continue to do so at a reasonable cost or at all. If we are unable to effectively manage our interest rate exposure through derivative transactions, any increase in market interest rates would increase our interest rate exposure and debt service obligations, which would exacerbate the risks associated with our leveraged capital structure.

In July 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. Currently, it is not possible to predict the exact transitional arrangements for calculating applicable reference rates that may be made in the U.K., the U.S., the Eurozone or elsewhere given that a number of outcomes are possible, including the cessation of the publication of one or more reference rates. Our credit agreements contain provisions that contemplate alternative calculations of the base rate applicable to our LIBOR-indexed debt to the extent LIBOR is not available, which alternative calculations we do not anticipate will be materially different from what would have been calculated under LIBOR. Additionally, no mandatory prepayment or redemption provisions would be triggered under

our credit agreements in the event that the LIBOR rate is not available. It is possible, however, that any new reference rate that applies to our LIBOR-indexed debt could be different than any new reference rate that applies to our LIBOR-indexed derivative instruments. We anticipate managing this difference and any resulting increased variable-rate exposure through modifications to our debt and/or derivative instruments, however future market conditions may not allow immediate implementation of desired modifications and/or the company may incur significant associated costs.

We are subject to increasing operating costs and inflation risks, which may adversely affect our results of operations. While our operations attempt to increase our subscription rates to offset increases in programming and operating costs, there is no assurance that they will be able to do so. In certain countries in which we operate, our ability to increase subscription rates is subject to regulatory controls. Also, our ability to increase subscription rates may be constrained by competitive pressures. Therefore, operating costs may rise faster than associated revenue, resulting in a material negative impact on our cash flow and net earnings (loss). We are also impacted by inflationary increases in salaries, wages, benefits and other administrative costs in certain of our markets.

Continuing uncertainties and challenging conditions in the global economy and in the countries in which we operate may adversely impact our business, financial condition and results of operations. The current macroeconomic environment is highly volatile, and continuing instability in global markets, including ongoing trade negotiations, the risk of deflation and the stability of the British pound sterling and the euro, has contributed to a challenging global economic environment. Future developments are dependent upon a number of political and economic factors, including the effectiveness of measures by the E.U. Commission to address debt burdens of certain countries in Europe and low growth expectations. As a result, we cannot predict how long challenging conditions will exist or the extent to which the markets in which we operate may deteriorate. Additional risks arising from the ongoing economic challenges in Europe are described below under the Risk Factor titled: *We are exposed to sovereign debt and currency instability risks that could have an adverse impact on our liquidity, financial condition and cash flows.*

Unfavorable economic conditions may impact a significant number of our subscribers and/or the prices we are able to charge for our products and services, and, as a result, it may be (1) more difficult for us to attract new subscribers, (2) more likely that subscribers will downgrade or disconnect their services and (3) more difficult for us to maintain ARPUs at existing levels. Countries may also seek new or increased revenue sources due to fiscal deficits. Such actions may further adversely affect our company. Accordingly, our ability to increase, or, in certain cases, maintain, the revenue, ARPUs, RGUs, mobile subscribers, Adjusted OIBDA, Adjusted OIBDA margins and liquidity of our operating segments could be adversely affected if the macroeconomic environment remains uncertain or declines further. We are currently unable to predict the extent of any of these potential adverse effects.

We are exposed to sovereign debt and currency instability risks that could have an adverse impact on our liquidity, financial condition and cash flows. Our operations are subject to macroeconomic and political risks that are outside of our control. For example, high levels of sovereign debt in the U.S. and several countries in which we or our affiliates operate, combined with weak growth and high unemployment, could potentially lead to fiscal reforms (including austerity measures), tax increases, sovereign debt restructurings, currency instability, increased counterparty credit risk, high levels of volatility and disruptions in the credit and equity markets, as well as other outcomes that might adversely impact our company. With regard to currency instability issues, concerns exist in the eurozone with respect to individual macro-fundamentals on a country-by-country basis, as well as with respect to the overall stability of the European monetary union and the suitability of a single currency to appropriately deal with specific fiscal management and sovereign debt issues in individual eurozone countries. The realization of these concerns could lead to the exit of one or more countries from the European monetary union and the re-introduction of individual currencies in these countries, or, in more extreme circumstances, the possible dissolution of the European monetary union entirely, which could result in the redenomination of a portion or, in the extreme case, all of our euro-denominated assets, liabilities and cash flows to the new currency of the country in which they originated. This could result in a mismatch in the currencies of our assets, liabilities and cash flows. Any such mismatch, together with the capital market disruption that would likely accompany any such redenomination event, could have a material adverse impact on our liquidity and financial condition. Furthermore, any redenomination event would likely be accompanied by significant economic dislocation, particularly within the eurozone countries, which in turn could have an adverse impact on demand for our products and services, and accordingly, on our revenue and cash flows. Moreover, any changes from euro to non-euro currencies within the countries in which we operate would require us to modify our billing and other financial systems. No assurance can be given that any required modifications could be made within a time frame that would allow us to timely bill our customers or prepare and file required financial reports. In light of the significant exposure that we have to the euro through our euro-denominated borrowings, derivative instruments, cash balances and cash flows, a redenomination event could have a material adverse impact on our company.

We may not freely access the cash of our operating companies. Our operations are conducted through our subsidiaries. Our current sources of corporate liquidity include (1) our cash and cash equivalents and (2) interest and dividend income received on our cash and cash equivalents and investments. From time to time, we also receive (1) proceeds in the form of distributions or

loan repayments from our subsidiaries or affiliates, (2) proceeds upon the disposition of investments and other assets and (3) proceeds in connection with the incurrence of debt or the issuance of equity securities. The ability of our operating subsidiaries to pay dividends or to make other payments or advances to us depends on their individual operating results and any statutory, regulatory or contractual restrictions to which they may be or may become subject and in some cases our receipt of such payments or advances may be limited due to tax considerations or the presence of noncontrolling interests. Most of our operating subsidiaries are subject to credit agreements or indentures that restrict sales of assets and prohibit or limit the payment of dividends or the making of distributions, loans or advances to shareholders and partners, including us. In addition, because these subsidiaries are separate and distinct legal entities they have no obligation to provide us funds for payment obligations, whether by dividends, distributions, loans or other payments.

We are exposed to the risk of default by the counterparties to our cash investments, derivative and other financial instruments, and undrawn debt facilities. Although we seek to manage the credit risks associated with our cash investments, derivative and other financial instruments, and undrawn debt facilities, we are exposed to the risk that our counterparties will default on their obligations to us. While we regularly review our credit exposures and currently have no specific concerns about the creditworthiness of any counterparty for which we have material credit risk exposures, we cannot rule out the possibility that one or more of our counterparties could fail or otherwise be unable to meet its obligations to us. Any such instance of default or failure could have an adverse effect on our cash flows, results of operations, financial condition and/or liquidity. In this regard, (1) we may incur losses to the extent that we are unable to recover debts owed to us, including cash deposited and the value of financial losses, (2) we may incur significant costs to recover amounts owed to us, and such recovery may take a long period of time or may not be possible at all, (3) our derivative liabilities may be accelerated by the default of our counterparty, (4) we may be exposed to financial risks as a result of the termination of affected derivative contracts, and it may be costly or impossible to replace such contracts or otherwise mitigate such risks, (5) amounts available under committed credit facilities may be reduced and (6) disruption to the credit markets could adversely impact our ability to access debt financing on favorable terms, or at all.

At December 31, 2019, our exposure to counterparty credit risk included (1) derivative assets with an aggregate fair value of \$253.2 million, (2) cash and cash equivalent and restricted cash balances of \$8,180.9 million and (3) aggregate undrawn debt facilities of \$3,005.0 million. For additional information on our derivative contracts, see note 8 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

Our interest in the VodafoneZiggo JV is held pursuant to a Shareholders Agreement that contains provisions relating to governance as well as transfer and exit rights, which, depending on the circumstances, may not be in the best interest of our company. Our non-controlling interest in the VodafoneZiggo JV is held pursuant to a shareholders' agreement (the **Shareholders Agreement**), which provides the terms of the governance of the VodafoneZiggo JV, including among others, decision-making process, information access, dividend policy and non-compete provisions. These provisions may prevent the VodafoneZiggo JV from making decisions or taking actions that would protect or advance the interests of our company, and could even result in the VodafoneZiggo JV making decisions or taking actions that adversely impact our company. Further, our ability to access the cash of the VodafoneZiggo JV pursuant to the dividend policy contained in the Shareholders Agreement may be restricted in certain circumstances. The Shareholders Agreement also provides for restrictions on the transfer of interests in the VodafoneZiggo JV, which could adversely affect our ability to sell our interest in the VodafoneZiggo JV and/or the prices at which our interest may be sold, as well as certain exit arrangements, which could force us to sell our interest. For additional information on the VodafoneZiggo JV and the Shareholders Agreement, see note 7 to our consolidated financial statements included in Part II of this Annual Report on Form 10-K.

We may not report net earnings. We reported losses from continuing operations of \$1,409.0 million, \$1,411.5 million and \$2,350.0 million during 2019, 2018 and 2017, respectively. In light of our historical financial performance, we cannot assure you that we will report net earnings in the near future.

Other Factors

We have not historically paid any cash dividends, and we may not pay dividends equally or at all on any class of our ordinary shares. We do not presently intend to pay cash dividends on any class of our ordinary shares for the foreseeable future. However, we have the right to pay dividends, effect securities distributions or make bonus issues on Liberty Global Shares. In addition, any dividends or distributions on, or repurchases of Liberty Global Shares will reduce our "distributable reserves" (defined as our accumulated, realized profits less accumulated, realized losses, as measured for U.K. statutory purposes) legally available to be paid as dividends by our company under English law on any of our ordinary shares.

Our share price may change significantly, and you may not be able to resell our ordinary shares at or above the price you paid or at all, and you could lose all or part of your investment as a result. In addition to the factors discussed in this Annual

Report on Form 10-K, the trading price of each class of our ordinary shares may fluctuate significantly in response to numerous factors, many of which are beyond our control, including:

- actual or anticipated fluctuations in our revenue and other operating results;
- actual operating or financial results that vary from our guidance or the expectations of securities analysts and investors;
- changes in expectations as to our future financial performance, including financial estimates by securities analysts and investors;
- actual or anticipated future sales of our ordinary shares by us, our senior management or our other existing shareholders;
- investor sentiment with respect to our competitors, our business partners, and our industry in general;
- announcements by us or our competitors of significant services or features, technical innovations, acquisitions, strategic partnerships, joint ventures, or capital commitments;
- changes in operating performance and stock market valuations of companies in our industry, including our competitors;
- price and volume fluctuations in the overall stock market, including as a result of trends in the economy as a whole;
- media coverage of our business and financial performance; and
- general domestic and international economic and political conditions.

The stock market has recently experienced extreme price and volume fluctuations that have affected and continue to affect the market prices of equity securities of many companies. In particular, price and volume fluctuations in the stock market as a whole may affect the market price of our ordinary shares in ways that may be unrelated or disproportionate to our operating performance. These broad market and industry fluctuations may adversely affect the trading price of our ordinary shares, regardless of our actual operating performance.

Securities class action litigation has often been instituted against companies following periods of volatility in the overall market and in the market price of a company's securities. Such litigation, if instituted against us, could result in substantial costs, divert our management's attention and resources and have an adverse effect on our business, results of operations and financial condition.

The loss of certain key personnel could harm our business. We have experienced employees at both the corporate and operational levels who possess substantial knowledge of our business and operations. We cannot assure you that we will be successful in retaining their services or that we would be successful in hiring and training suitable replacements without undue costs or delays. As a result, the loss of any of these key employees could cause significant disruptions in our business operations, which could materially adversely affect our results of operations.

John C. Malone has significant voting power with respect to corporate matters considered by our shareholders. John C. Malone beneficially owns outstanding ordinary shares of Liberty Global representing 30.5% of our aggregate voting power as of February 7, 2020. By virtue of Mr. Malone's voting power in our company, as well as his position as Chairman of our board of directors, Mr. Malone may have significant influence over the outcome of any corporate transaction or other matters submitted to our shareholders for approval. For example, under English law and our articles of association, certain matters (including amendments to the articles of association) require the approval of 75% of the shareholders who vote (in person or by proxy) on the relevant resolution, and other certain corporate transactions or matters may require the approval of at least 75% of the outstanding shares of each class of our ordinary shares. Because Mr. Malone beneficially owns approximately 30.5% of our aggregate voting power and more than 72% of the outstanding Class B ordinary shares of Liberty Global, he has the ability to prevent the requisite approval threshold from being met even though the other shareholders may determine that such action or transaction is beneficial for the company. Mr. Malone's rights to vote or dispose of his equity interests in our company are not subject to any restrictions in favor of us other than as may be required by applicable law and except for customary transfer restrictions pursuant to equity award agreements.

It may be difficult for a third-party to acquire us, even if doing so may be beneficial to our shareholders. Certain provisions of our articles of association and of English law may discourage, delay, or prevent a change in control of our company that a shareholder may consider favorable. These provisions include the following:

- authorizing a capital structure with multiple classes of ordinary shares; a Class B that entitles the holders to 10 votes per share; a Class A that entitles the holders to one vote per share; and a Class C that, except as otherwise required by applicable law, entitles the holders to no voting rights;
- authorizing the issuance of “blank check” shares (both ordinary and preference), which could be issued by our board of directors to increase the number of outstanding shares and thwart a takeover attempt;
- classifying our board of directors with staggered three-year terms, which may lengthen the time required to gain control of our board of directors, although under English law, shareholders of our company can remove a director without cause by ordinary resolution;
- prohibiting shareholder action by written resolution, thereby requiring all shareholder actions to be taken at a meeting of the shareholders;
- requiring the approval of 75% in value of the shareholders (or class of shareholders) and/or English court approval for certain statutory mergers or schemes of arrangements; and
- establishing advance notice requirements for nominations of candidates for election to our board of directors or for proposing matters that can be acted upon by shareholders at shareholder meetings.

Change in control provisions in our incentive plans and related award agreements or in executive employment agreements may also discourage, delay, or prevent a change in control of our company, even if such change of control would be in the best interests of our shareholders.

The enforcement of civil liabilities against us may be more difficult. Because we are a public limited company incorporated under the laws of England and Wales, investors could experience more difficulty enforcing judgments obtained against us in U.S. courts than would currently be the case for U.S. judgments obtained against a U.S. company. It may also be more difficult (or impossible) to bring some types of claims against us in courts sitting in England than it would be to bring similar claims against a U.S. company in a U.S. court. In particular, English law significantly limits the circumstances under which shareholders of English companies may bring derivative actions. Under English law generally, only the company can be the proper plaintiff in proceedings in respect of wrongful acts committed against us. Our articles of association provide for the exclusive jurisdiction of the English courts for shareholder lawsuits against us or our directors.

Item 1B. UNRESOLVED STAFF COMMENTS

None.

Item 2. PROPERTIES

We lease our corporate offices in London, U.K., in Denver, Colorado, U.S. and in Amsterdam, the Netherlands. All of our other real or personal property is owned or leased by our subsidiaries and affiliates.

Our subsidiaries and affiliates own or lease the fixed assets necessary for the operation of their respective businesses, including office space, transponder space, headend facilities, rights of way, cable television and telecommunications distribution equipment, telecommunications switches, base stations, cell towers and customer premises equipment and other property necessary for their operations. The physical components of their broadband networks require maintenance and periodic upgrades to support the new services and products they introduce. Subject to these maintenance and upgrade activities, our management believes that our current facilities are suitable and adequate for our business operations for the foreseeable future.

Item 3. LEGAL PROCEEDINGS

From time to time, our subsidiaries and affiliates have become involved in litigation relating to claims arising out of their operations in the normal course of business. For additional information, see note 19 to our consolidated financial statements in Part II of this Annual Report on Form 10-K.

Item 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

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

General

The capitalized terms used in Part II of this Annual Report on Form 10-K are defined in the notes to our consolidated financial statements. In the following text, the terms “we,” “our,” “our company” and “us” may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries.

Market Information

Our share capital comprises Liberty Global Class A, Class B and Class C ordinary shares, which trade on the Nasdaq Global Select Market under the symbols “LBTYA,” “LBTYB,” and “LBTYK,” respectively. Share price information for securities traded on the Nasdaq Global Select Market can be found on the Nasdaq’s website at www.nasdaq.com.

The following table sets forth the quarterly range of high and low sales prices of Liberty Global Class B ordinary shares for 2019 and 2018. Although Liberty Global Class B ordinary shares are traded on the Nasdaq Global Select Market, an established public trading market does not exist for the shares, as they are not actively traded.

	Liberty Global Class B ordinary shares	
	High	Low
2019		
First quarter	\$ 26.60	\$ 20.99
Second quarter	\$ 30.05	\$ 24.74
Third quarter	\$ 29.11	\$ 24.66
Fourth quarter	\$ 25.05	\$ 22.61
2018		
First quarter	\$ 39.00	\$ 31.65
Second quarter	\$ 32.55	\$ 28.00
Third quarter	\$ 29.10	\$ 26.75
Fourth quarter	\$ 27.18	\$ 20.70

Holdings

As of January 31, 2020, there were 596, seven and 690 record holders of Liberty Global Class A, Class B and Class C ordinary shares, respectively. These amounts do not include the number of shareholders whose shares are nominally held by banks, brokerage houses or other institutions, but include each such institution as one record holder.

Dividends

We have not paid any cash dividends on any of our ordinary shares, and we have no present intention of doing so. Any future payment of cash dividends will be determined by our board of directors in light of our earnings, financial condition and other relevant considerations, including applicable laws in England and Wales.

Recent Sales of Unregistered Securities; Use of Proceeds from Registered Securities

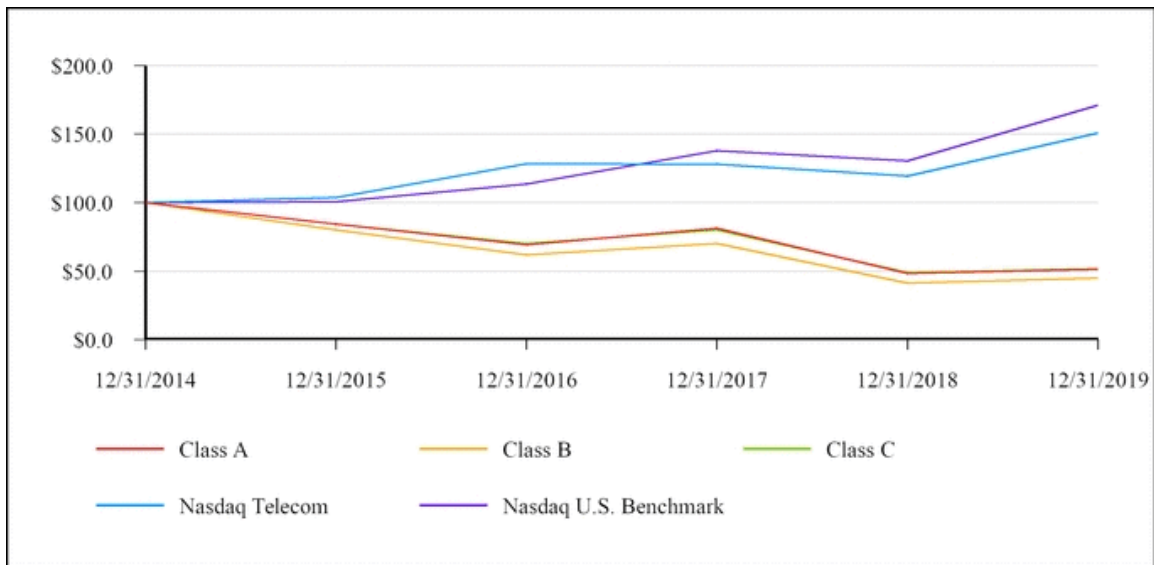
None.

Issuer Purchase of Equity Securities

Our company did not purchase any of its own equity securities during the three months ended December 31, 2019. As of December 31, 2019, the remaining amount authorized for share repurchases was \$66.4 million. In February 2020, our board of directors authorized an additional \$1.0 billion for share repurchases.

Stock Performance Graph

The following graph compares the changes in the cumulative total shareholder return on our Liberty Global Class A, Class B and Class C ordinary shares from January 1, 2015 to December 31, 2019, to the change in the cumulative total return on the ICB 6500 Telecommunications and the Nasdaq US Benchmark TR Index (assuming reinvestment of dividends, where applicable). The performance presented below includes the retrospective impact of certain distributions of LiLAC Shares on July 1, 2015 and 2016. The graph assumes that \$100 was invested on January 1, 2015.



	December 31,				
	2015	2016	2017	2018	2019
Liberty Global - Class A	\$ 84.37	\$ 69.39	\$ 81.30	\$ 48.41	\$ 51.58
Liberty Global - Class B	\$ 80.13	\$ 61.99	\$ 70.08	\$ 41.40	\$ 44.83
Liberty Global - Class C	\$ 84.39	\$ 70.30	\$ 80.10	\$ 48.86	\$ 51.59
ICB 6500 Telecommunications	\$ 103.59	\$ 128.22	\$ 128.09	\$ 119.36	\$ 150.83
Nasdaq US Benchmark TR Index	\$ 100.48	\$ 113.55	\$ 137.83	\$ 130.33	\$ 170.96

Item 6. SELECTED FINANCIAL DATA

The following tables present the selected historical financial information of our continuing operations (unless otherwise indicated), which was derived from our consolidated financial statements as of and for the years ended December 31, 2019, 2018, 2017, 2016 and 2015. This information is only a summary and should be read together with our *Management's Discussion and Analysis of Financial Condition and Results of Operations* and consolidated financial statements included elsewhere herein.

	December 31,				
	2019	2018	2017	2016	2015
	in millions				
<i>Summary Balance Sheet Data (a):</i>					
Investments	\$ 4,782.0	\$ 5,121.8	\$ 6,671.4	\$ 6,388.7	\$ 2,839.3
Property and equipment, net	\$ 13,843.4	\$ 13,878.9	\$ 14,149.0	\$ 12,235.4	\$ 15,676.6
Goodwill	\$ 14,052.1	\$ 13,715.8	\$ 14,354.1	\$ 12,763.9	\$ 21,801.0
Total assets (including discontinued operations)	\$ 49,046.3	\$ 53,153.6	\$ 57,596.8	\$ 68,684.1	\$ 67,645.2
Debt and finance lease obligations, including current portion	\$ 28,182.5	\$ 29,805.2	\$ 32,644.5	\$ 28,843.6	\$ 35,955.7
Total equity	\$ 13,198.6	\$ 4,148.3	\$ 6,393.0	\$ 14,732.0	\$ 10,174.3
	Year ended December 31,				
	2019	2018	2017	2016	2015
	in millions, except per share amounts				
<i>Summary Statement of Operations Data (a):</i>					
Revenue	\$ 11,541.5	\$ 11,957.9	\$ 11,276.4	\$ 13,731.1	\$ 13,680.0
Operating income	\$ 745.5	\$ 839.1	\$ 792.4	\$ 1,570.1	\$ 1,189.1
Earnings (loss) from continuing operations	\$ (1,409.0)	\$ (1,411.5)	\$ (2,350.0)	\$ 1,650.3	\$ (1,456.6)
Earnings (loss) from continuing operations attributable to Liberty Global shareholders	\$ (1,525.8)	\$ (1,532.0)	\$ (2,421.4)	\$ 1,624.5	\$ (1,546.3)
Basic earnings (loss) from continuing operations attributable to Liberty Global shareholders per share:					
Liberty Global Shares (b)	\$ (2.16)	\$ (1.97)	\$ (2.86)	\$ 1.83	\$ (1.79)
Old Liberty Global Shares (c)					\$ (1.75)
Diluted earnings (loss) from continuing operations attributable to Liberty Global shareholders per share:					
Liberty Global Shares (b)	\$ (2.16)	\$ (1.97)	\$ (2.86)	\$ 1.81	\$ (1.79)
Old Liberty Global Shares (c)					\$ (1.75)

- (a) Our continuing operations completed a number of acquisitions during the years presented, the most significant of which was BASE on February 11, 2016. On December 31, 2016, we completed the VodafoneZiggo JV Transaction, pursuant to which we contributed VodafoneZiggo Holding to the VodafoneZiggo JV. In addition, we acquired C&W on May 16, 2016, which was attributed to the LiLAC Group. Effective December 31, 2017, we completed the Split-off Transaction, pursuant to which the businesses, assets and liabilities of the LiLAC Group were transferred to an independent publicly-traded company, and on July 31, 2019, we completed the sale of the Vodafone Disposal Group. Accordingly, the selected financial data included in this table presents the LiLAC Group and Vodafone Disposal Group as discontinued operations for all applicable periods. For information regarding our acquisitions and dispositions during the past three years, see notes 5 and 6, respectively, to our consolidated financial statements.
- (b) The per share amounts presented for 2015 relate to the period from July 1, 2015 through December 31, 2015.
- (c) The per share amounts presented for 2015 relate to the period from January 1, 2015 through June 30, 2015. "Old Liberty Global Shares" refers to our Class A, Class B and Class C ordinary shares that were outstanding prior to being reclassified into Liberty Global Shares in connection with the Split-off Transaction, as further described in note 14 to our consolidated financial statements.

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

The following discussion and analysis, which should be read in conjunction with our consolidated financial statements, is intended to assist in providing an understanding of our results of operations and financial condition and is organized as follows:

- *Overview.* This section provides a general description of our business and recent events.
- *Results of Operations.* This section provides an analysis of our results of operations for the years ended December 31, 2019 and 2018.
- *Liquidity and Capital Resources.* This section provides an analysis of our corporate and subsidiary liquidity, consolidated statements of cash flows and contractual commitments.
- *Critical Accounting Policies, Judgments and Estimates.* This section discusses those material accounting policies that involve uncertainties and require significant judgment in their application.
- *Quantitative and Qualitative Disclosures about Market Risk.* This section provides discussion and analysis of the foreign currency, interest rate and other market risk that our company faces.

Unless otherwise indicated, convenience translations into U.S. dollars are calculated, and operational data is presented, as of December 31, 2019.

Included below is an analysis of our results of operations and cash flows for 2019, as compared to 2018. An analysis of our results of operations and cash flows for 2018, as compared to 2017, can be found under Item 7. *Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our Annual Report on Form 10-K, as amended, for the year ended December 31, 2018 (our **2018 10-K**), which is available through the Securities and Exchange Commission's website at www.sec.gov.

Overview

General

We are an international provider of broadband internet, video, fixed-line telephony and mobile communications services to residential customers and businesses in Europe. Our continuing operations comprise businesses that provide residential and B2B communications services in (i) the U.K. and Ireland through Virgin Media, (ii) Belgium through Telenet and (iii) Switzerland, Poland and Slovakia through UPC Holding. In addition, we own a 50% noncontrolling interest in the VodafoneZiggo JV, which provides residential and B2B communications services in the Netherlands.

As further described in note 6 to our consolidated financial statements, we (i) completed the sale of our operations in Germany, Romania, Hungary and the Czech Republic (exclusive of our DTH operations) on July 31, 2019, (ii) completed the sale of the operations of UPC DTH on May 2, 2019, (iii) completed the sale of our operations in Austria on July 31, 2018 and (iv) completed the Split-off Transaction on December 29, 2017. Accordingly, (a) our operations in Austria, Germany, Romania, Hungary and the Czech Republic and the operations of UPC DTH are presented as discontinued operations for all applicable periods and (b) the entities comprising the LiLAC Group are presented as discontinued operations in our consolidated statements of operations and cash flows for 2017. In the following discussion and analysis, the operating statistics, results of operations, cash flows and financial condition that we present and discuss are those of our continuing operations unless otherwise indicated.

Operations

At December 31, 2019, we owned and operated networks that passed 25,759,100 homes and served 25,047,500 revenue generating units (**RGUs**), consisting of 9,345,200 broadband internet subscribers, 8,281,200 video subscribers and 7,421,100 fixed-line telephony subscribers. In addition, at December 31, 2019, our continuing operations served 6,295,200 mobile subscribers.

Broadband internet services. We offer multiple tiers of broadband internet service with download speeds of up to 1.1 Gbps depending on location. We continue to invest in new technologies that allow us to increase the internet speeds we offer to our customers.

Video services. We provide video services, including various enhanced products that enable our customers to control when they watch their programming. These products range from digital video recorders to multimedia home gateway systems capable of distributing video, voice and data content throughout the home and to multiple devices.

Fixed-line telephony services. We offer fixed-line telephony services via either voice-over-internet-protocol or “VoIP” technology or circuit-switched telephony, depending on location.

Mobile services. We offer voice and data mobile services over our own network in Belgium and as an MVNO over third-party networks in the U.K., Switzerland, Ireland and Poland. In addition, we generate revenue from the sale of mobile handsets.

B2B services. Our B2B services include voice, broadband internet, data, video, wireless and cloud services.

For additional information regarding the details of our products and services, see *Item 1. Business* included in Part I of this Annual Report on Form 10-K.

Strategy and Management Focus

From a strategic perspective, we are seeking to build broadband communications and mobile businesses that have strong prospects for future growth. As discussed further under *Liquidity and Capital Resources — Capitalization* below, we also seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk.

We strive to achieve organic revenue and customer growth in our operations by developing and marketing bundled entertainment and information and communications services, and extending and upgrading the quality of our networks where appropriate. As we use the term, organic growth excludes foreign currency translation effects (FX) and the estimated impact of acquisitions and dispositions. While we seek to increase our customer base, we also seek to maximize the average revenue we receive from each household by increasing the penetration of our broadband internet, digital video, fixed-line telephony and mobile services with existing customers through product bundling and upselling.

We currently are engaged in certain network extension programs across our footprint, which we collectively refer to as the “Network Extensions.” During 2019, pursuant to the Network Extensions, we connected approximately 649,000 additional residential and commercial premises (excluding upgrades) to our networks, including approximately 505,000 residential and commercial premises connected by Virgin Media in the U.K. and Ireland. We expect to continue the Network Extensions in 2020. Depending on a variety of factors, including the financial and operational results of our new build programs, the Network Extensions may be continued, modified or cancelled at our discretion.

The capital costs associated with the Network Extensions, which include the costs to build out the networks and the purchase and installation of related customer premises equipment, are expected to decline in 2020 as compared to 2019, but still represent a large portion of our capital costs. For information regarding our expected property and equipment additions during 2020, see *Liquidity and Capital Resources — Consolidated Statements of Cash Flows* below.

Our assessment of the impacts of the Network Extensions are subject to competitive, economic, regulatory and other factors outside of our control.

Competition and Other External Factors

We are experiencing competition in all of the markets in which we or our affiliates operate. This competition, together with macroeconomic and regulatory factors, has adversely impacted our revenue, RGUs and/or average monthly subscription revenue per average cable RGU or mobile subscriber, as applicable (ARPU). For additional information regarding the competition we face, see *Item 1. Business - Competition and - Regulatory Matters* included in Part I of this Annual Report on Form 10-K. For additional information regarding the revenue impact of changes in the RGUs and ARPU of our consolidated reportable segments, see *Discussion and Analysis of our Reportable Segments* below.

In addition to competition, our operations are subject to macroeconomic, political and other risks that are outside of our control. For example, on June 23, 2016, the U.K. held a referendum in which voters approved, on an advisory basis, an exit from the E.U., commonly referred to as “Brexit.” The U.K. formally exited the E.U. on January 31, 2020, and has now entered into a transition period until December 31, 2020, during which the U.K. and the E.U. will negotiate to formalize the future U.K.-E.U. relationship with respect to a number of matters, most notably trade. Although the U.K. has ceased to be an E.U. member, during the transition period their trading relationship will remain the same and the U.K. will continue to follow the E.U.’s rules, such as accepting rulings from the European Court of Justice, and the U.K. will continue to contribute to the E.U.’s budget. Uncertainty remains as to what specific terms of separation may be agreed during the transition period. It is possible that the U.K. will fail to agree to specific separation terms with the E.U. by the end of the transition period, which, absent extension, may require the U.K. to leave the E.U. under a so-called “hard Brexit” or “no-deal Brexit” without specific agreements on trade, finance and other key

elements. The foregoing has caused uncertainty as to Brexit's impact on the free movement of goods, services, people and capital between the U.K. and the E.U., customer behavior, economic conditions, interest rates, currency exchange rates and availability of capital. The effects of Brexit could adversely affect our business, results of operations and financial condition. For additional information regarding the potential impact of Brexit on our company, see *Item 1A. Risk Factors* included in Part I of this Annual Report on Form 10-K.

For information regarding certain other regulatory developments that could adversely impact our results of operations in future periods, see *Legal and Regulatory Proceedings and Other Contingencies - Other Regulatory Matters* in note 19 to our consolidated financial statements.

Results of Operations

We have completed a number of transactions that impact the comparability of our 2019 and 2018 results of operations, the most notable of which is the De Vijver Media Acquisition on June 3, 2019. For further information, see note 5 to our consolidated financial statements.

In the following discussion, we quantify the estimated impact of acquisitions (the **Acquisition Impact**) on our operating results. The Acquisition Impact represents our estimate of the difference between the operating results of the periods under comparison that is attributable to an acquisition. In general, we base our estimate of the Acquisition Impact on an acquired entity's operating results during the first three to twelve months following the acquisition date, as adjusted to remove integration costs and any other material unusual or nonoperational items, such that changes from those operating results in subsequent periods are considered to be organic changes. Accordingly, in the following discussion, (i) organic variances attributed to an acquired entity during the first 12 months following the acquisition date represent differences between the Acquisition Impact and the actual results and (ii) the calculation of our organic change percentages includes the organic activity of an acquired entity relative to the Acquisition Impact of such entity.

Changes in foreign currency exchange rates have a significant impact on our reported operating results as all of our operating segments have functional currencies other than the U.S. dollar. Our primary exposure to FX risk during the three months ended December 31, 2019 was to the British pound sterling and euro as 53.0% and 32.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling and euro, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for certain other local currencies in Europe. The portions of the changes in the various components of our results of operations that are attributable to changes in FX are highlighted under *Discussion and Analysis of our Reportable Segments* and *Discussion and Analysis of our Consolidated Operating Results* below. For information regarding our foreign currency risks and the applicable foreign currency exchange rates in effect for the periods covered by this Annual Report on Form 10-K, see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

The amounts presented and discussed below represent 100% of each of our consolidated reportable segment's revenue and Adjusted OIBDA. As we have the ability to control Telenet, we consolidate 100% of its revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners' interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations.

Discussion and Analysis of our Reportable Segments

General

All of our reportable segments derive their revenue primarily from residential and B2B communications services, including broadband internet, video, fixed-line telephony and mobile services. For detailed information regarding the composition of our reportable segments and how we define and categorize our revenue components, see note 20 to our consolidated financial statements. For information regarding the results of operations of the Vodafone Ziggo JV, refer to *Discussion and Analysis of our Consolidated Operating Results - Share of results of affiliates* below.

The tables presented below in this section provide the details of the revenue and Adjusted OIBDA of our consolidated reportable segments for 2019, as compared to 2018. These tables present (i) the amounts reported for the current and comparative periods, (ii) the reported U.S. dollar change and percentage change from period to period and (iii) the organic U.S. dollar change and percentage change from period to period. For our organic comparisons, which exclude the impact of FX, we assume that exchange rates remained constant at the prior-period rate during all periods presented. We also provide a table showing the Adjusted OIBDA margins of our consolidated reportable segments for 2019, 2018 and 2017 at the end of this section.

Most of our revenue is derived from jurisdictions that administer VAT or similar revenue-based taxes. Any increases in these taxes could have an adverse impact on our ability to maintain or increase our revenue to the extent that we are unable to pass such tax increases on to our customers. In the case of revenue-based taxes for which we are the ultimate taxpayer, we will also experience increases in our operating costs and expenses and corresponding declines in our Adjusted OIBDA and Adjusted OIBDA margins to the extent of any such tax increases.

We pay interconnection fees to other telephony providers when calls or text messages from our subscribers terminate on another network, and we receive similar fees from such providers when calls or text messages from their customers terminate on our networks or networks that we access through MVNO or other arrangements. The amounts we charge and incur with respect to fixed-line telephony and mobile interconnection fees are subject to regulatory oversight. To the extent that regulatory authorities introduce fixed-line or mobile termination rate changes, we would experience prospective changes and, in very limited cases, we could experience retroactive changes in our interconnect revenue and/or costs. The ultimate impact of any such changes in termination rates on our Adjusted OIBDA would be dependent on the call or text messaging patterns that are subject to the changed termination rates.

We are subject to inflationary pressures with respect to certain costs and foreign currency exchange risk with respect to costs and expenses that are denominated in currencies other than the respective functional currencies of our consolidated reportable segments (**non-functional currency expenses**). Any cost increases that we are not able to pass on to our subscribers through rate increases would result in increased pressure on our operating margins. For additional information regarding our foreign currency exchange risks see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Revenue of our Consolidated Reportable Segments

General. While not specifically discussed in the below explanations of the changes in the revenue of our consolidated reportable segments, we are experiencing competition in all of our markets. This competition has an adverse impact on our ability to increase or maintain our RGUs and/or ARPU.

Variances in the subscription revenue that we receive from our customers are a function of (i) changes in the number of RGUs or mobile subscribers outstanding during the period and (ii) changes in ARPU. Changes in ARPU can be attributable to (a) changes in prices, (b) changes in bundling or promotional discounts, (c) changes in the tier of services selected, (d) variances in subscriber usage patterns and (e) the overall mix of cable and mobile products within a segment during the period. In the following discussion, we discuss ARPU changes in terms of the net impact of the above factors on the ARPU that is derived from our broadband internet, video, fixed-line telephony and mobile products.

Revenue — 2019 compared to 2018

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2019	2018	\$	%	\$	%
in millions, except percentages						
U.K./Ireland	\$ 6,600.3	\$ 6,875.1	\$ (274.8)	(4.0)	\$ 28.9	0.4
Belgium	2,893.0	2,993.6	(100.6)	(3.4)	(46.9)	(1.5)
Switzerland	1,258.8	1,326.0	(67.2)	(5.1)	(47.4)	(3.6)
Central and Eastern Europe	475.4	492.2	(16.8)	(3.4)	13.5	2.7
Central and Corporate (a)	316.4	274.2	42.2	15.4	(36.1)	(9.8)
Intersegment eliminations	(2.4)	(3.2)	0.8	N.M.	0.8	N.M.
Total	\$ 11,541.5	\$ 11,957.9	\$ (416.4)	(3.5)	\$ (87.2)	(0.7)

N.M. — Not Meaningful.

(a) Amounts primarily include revenue earned from transition and other services provided to the VodafoneZiggo JV and various third parties. In addition, the amount for 2018 includes revenue associated with a wholesale handset program that was discontinued on December 31, 2018. For additional information, see notes 6 and 7 to our consolidated financial statements.

U.K./Ireland. The details of the decrease in U.K./Ireland's revenue during 2019, as compared to 2018, are set forth below:

	Subscription revenue	Non-subscription revenue	Total
	in millions		
Increase in residential cable subscription revenue due to change in:			
Average number of RGUs (a)	\$ 42.4	\$ —	\$ 42.4
ARPU (b)	12.6	—	12.6
Decrease in residential cable non-subscription revenue (c)	—	(15.5)	(15.5)
Total increase (decrease) in residential cable revenue	55.0	(15.5)	39.5
Increase (decrease) in residential mobile revenue (d)	2.1	(11.7)	(9.6)
Increase (decrease) in B2B revenue (e)	13.5	(16.8)	(3.3)
Increase in other revenue	—	2.3	2.3
Total organic increase (decrease)	70.6	(41.7)	28.9
Impact of FX	(238.0)	(65.7)	(303.7)
Total	\$ (167.4)	\$ (107.4)	\$ (274.8)

- (a) The increase in residential cable subscription revenue related to a change in the average number of RGUs is attributable to the net effect of (i) an increase in the average number of broadband internet and fixed-line telephony RGUs and (ii) a decrease in the average number of video RGUs.
- (b) The increase in residential cable subscription revenue related to a change in ARPU is attributable to the net effect of (i) a net increase due to (a) higher ARPU from video and broadband internet services and (b) lower ARPU from fixed-line telephony services and (ii) an adverse change in RGU mix.
- (c) The decrease in residential cable non-subscription revenue is primarily attributable to our operations in the U.K., including (i) a decrease in revenue from late fees and (ii) lower installation revenue.
- (d) The increase in residential mobile subscription revenue is primarily due to an increase in the average number of mobile subscribers, partially offset by lower ARPU in the U.K. The decrease in residential mobile non-subscription revenue is primarily attributable to our operations in the U.K., including the net effect of (i) a decrease in revenue from mobile handset sales, which typically generate relatively low margins, and (ii) \$7.8 million of revenue recognized during 2019 in connection with the sale of rights to future commission payments on customer handset insurance arrangements.
- (e) The increase in B2B subscription revenue is primarily due to an increase in the average number of broadband internet SOHO subscribers in the U.K. The decrease in B2B non-subscription revenue is primarily attributable to our operations in the U.K., including the net effect of (i) an increase in upfront revenue recognized in association with long-term leases of a portion of our network, (ii) lower revenue from data services, (iii) a decrease in installation revenue, (iv) a decrease in revenue related to business network services and (v) lower revenue from wholesale fixed-line telephony services.

Belgium. The details of the decrease in Belgium’s revenue during 2019, as compared to 2018, are set forth below:

	Subscription revenue	Non-subscription revenue	Total
	in millions		
Increase (decrease) in residential cable subscription revenue due to change in:			
Average number of RGUs (a)	\$ (75.5)	\$ —	\$ (75.5)
ARPU (b)	54.2	—	54.2
Decrease in residential cable non-subscription revenue (c)	—	(8.9)	(8.9)
Total decrease in residential cable revenue	(21.3)	(8.9)	(30.2)
Increase (decrease) in residential mobile revenue (d)	(24.3)	23.0	(1.3)
Increase (decrease) in B2B revenue (e)	31.7	(47.1)	(15.4)
Total organic decrease	(13.9)	(33.0)	(46.9)
Impact of acquisitions	1.1	103.9	105.0
Impact of FX	(117.5)	(41.2)	(158.7)
Total	\$ (130.3)	\$ 29.7	\$ (100.6)

- (a) The decrease in residential cable subscription revenue related to a change in the average number of RGUs is attributable to a decline in the average number of video, broadband internet and fixed-line telephony RGUs.
- (b) The increase in residential cable subscription revenue related to a change in ARPU is primarily attributable to (i) higher ARPU from broadband internet and video services and (ii) an improvement in RGU mix.
- (c) The decrease in residential cable non-subscription revenue is primarily due to (i) lower revenue from equipment sales, (ii) lower interconnect revenue and (iii) a decrease in revenue from late fees.
- (d) The decrease in residential mobile subscription revenue is primarily attributable to lower ARPU. The increase in residential mobile non-subscription revenue is primarily due to an increase in revenue from the sale of mobile handsets and other devices.
- (e) The increase in B2B subscription revenue is primarily attributable to the net effect of (i) an increase in the average number of SOHO subscribers and (ii) lower ARPU from mobile SOHO services. The decrease in B2B non-subscription revenue is primarily due to (a) lower revenue from wholesale services and (b) a decrease in interconnect revenue.

For information concerning certain regulatory developments that could have an adverse impact on our revenue in Belgium, see *Belgium Regulatory Developments*” in note 19 to our consolidated financial statements.

Switzerland. The details of the decrease in Switzerland's revenue during 2019, as compared to 2018, are set forth below:

	Subscription revenue	Non-subscription revenue	Total
	in millions		
Decrease in residential cable subscription revenue due to change in:			
Average number of RGUs (a)	\$ (70.1)	\$ —	\$ (70.1)
ARPU (b)	(13.4)	—	(13.4)
Decrease in residential cable non-subscription revenue (c)	—	(0.2)	(0.2)
Total decrease in residential cable revenue	(83.5)	(0.2)	(83.7)
Increase in residential mobile revenue (d)	14.9	13.9	28.8
Increase in B2B revenue (e)	1.3	8.0	9.3
Decrease in other revenue	—	(1.8)	(1.8)
Total organic increase (decrease)	(67.3)	19.9	(47.4)
Impact of acquisitions	1.0	—	1.0
Impact of FX	(16.3)	(4.5)	(20.8)
Total	\$ (82.6)	\$ 15.4	\$ (67.2)

- (a) The decrease in residential cable subscription revenue related to a change in the average number of RGUs is primarily attributable to a decline in the average number of video and broadband internet RGUs.
- (b) The decrease in residential cable subscription revenue related to a change in ARPU is attributable to (i) a net decrease due to (a) lower ARPU from fixed-line telephony and video services and (b) higher ARPU from broadband internet services and (ii) an adverse change in RGU mix.
- (c) The decrease in residential cable non-subscription revenue is primarily attributable to the net effect of (i) a decrease in revenue associated with our Swiss sports channels and (ii) higher revenue from construction services provided to our partner networks.
- (d) The increase in residential mobile subscription revenue is primarily due to an increase in the average number of mobile subscribers. The increase in residential mobile non-subscription revenue is primarily attributable to an increase in revenue from mobile handset sales.
- (e) The increase in B2B non-subscription revenue is primarily due to higher revenue from wholesale fixed-line telephony services.

Central and Eastern Europe. The details of the decrease in Central and Eastern Europe's revenue during 2019, as compared to 2018, are set forth below:

	Subscription revenue	Non-subscription revenue	Total
	in millions		
Increase (decrease) in residential cable subscription revenue due to change in:			
Average number of RGUs (a)	\$ 13.5	\$ —	\$ 13.5
ARPU (b)	(6.1)	—	(6.1)
Decrease in residential cable non-subscription revenue	—	(1.3)	(1.3)
Total increase (decrease) in residential cable revenue	7.4	(1.3)	6.1
Increase in residential mobile revenue	—	0.1	0.1
Increase in B2B revenue (c)	3.0	3.6	6.6
Increase in other revenue	—	0.7	0.7
Total organic increase	10.4	3.1	13.5
Impact of FX	(28.5)	(1.8)	(30.3)
Total	\$ (18.1)	\$ 1.3	\$ (16.8)

- (a) The increase in residential cable subscription revenue related to a change in the average number of RGUs is primarily attributable to an increase in the average number of video and broadband internet RGUs, largely in Poland.
- (b) The decrease in residential cable subscription revenue related to a change in ARPU is primarily due to our operations in Poland, including (i) a net decrease due to (a) lower ARPU from video services and (b) higher ARPU from broadband internet services and (ii) an adverse change in RGU mix.
- (c) The increase in B2B subscription revenue is largely attributable to an increase in the average number of SOHO subscribers. The increase in B2B non-subscription revenue is primarily due to an increase in revenue from wholesale services in Poland.

Revenue — 2018 compared to 2017

For discussion and analysis of the revenue of our consolidated reportable segments during 2018, as compared to 2017, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2018 10-K.

Programming and Other Direct Costs of Services, Other Operating Expenses and SG&A Expenses of our Consolidated Reportable Segments

For information regarding the changes in our (i) programming and other direct costs of services, (ii) other operating expenses and (iii) SG&A expenses see *Discussion and Analysis of our Consolidated Operating Results* below.

Adjusted OIBDA of our Consolidated Reportable Segments

Adjusted OIBDA is the primary measure used by our chief operating decision maker to evaluate segment operating performance. For the definition of this performance measure and for a reconciliation of Adjusted OIBDA from continuing operations to earnings (loss) from continuing operations before income taxes, see note 20 to our consolidated financial statements.

Adjusted OIBDA — 2019 compared to 2018

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2019	2018 (a)	\$	%	\$	%
in millions, except percentages						
U.K./Ireland	\$ 2,800.5	\$ 2,995.5	\$ (195.0)	(6.5)	\$ (70.0)	(2.3)
Belgium	1,386.1	1,480.0	(93.9)	(6.3)	(30.5)	(2.0)
Switzerland	627.9	712.0	(84.1)	(11.8)	(73.7)	(10.4)
Central and Eastern Europe	215.0	233.6	(18.6)	(8.0)	(5.4)	(2.3)
Central and Corporate	(171.1)	(257.8)	86.7	33.6	4.5	2.5
Intersegment eliminations	1.1	(11.8)	12.9	N.M.	12.9	N.M.
Total	\$ 4,859.5	\$ 5,151.5	\$ (292.0)	(5.7)	\$ (162.2)	(3.1)

N.M. — Not Meaningful.

Adjusted OIBDA — 2018 compared to 2017

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2018 (a)	2017 (a)	\$	%	\$	%
pro forma (b)						
in millions, except percentages						
U.K./Ireland	\$ 2,995.5	\$ 2,805.1	\$ 190.4	6.8	\$ 92.0	3.3
Belgium	1,480.0	1,296.6	183.4	14.1	105.8	8.1
Switzerland	712.0	797.4	(85.4)	(10.7)	(90.4)	(11.3)
Central and Eastern Europe	233.6	220.9	12.7	5.7	3.2	1.4
Central and Corporate	(257.8)	(317.3)	59.5	18.8	49.7	14.8
Intersegment eliminations	(11.8)	(9.5)	(2.3)	N.M.	(2.3)	N.M.
Total	\$ 5,151.5	\$ 4,793.2	\$ 358.3	7.5	\$ 158.0	3.3

(a) Amounts have been revised to reflect the retrospective impact of the Centrally-held Cost Allocation, as further described in note 20 to our consolidated financial statements.

(b) As further described in note 2 to our consolidated financial statements, we adopted ASU 2014-09 on January 1, 2018 using the cumulative effect transition method. In order to provide a more meaningful comparison, Adjusted OIBDA for 2017 is presented on a pro forma basis that gives effect to the adoption of ASU 2014-09 as if such adoption had occurred on January 1, 2017.

N.M. — Not Meaningful.

Adjusted OIBDA Margin

The following table sets forth the Adjusted OIBDA margins (Adjusted OIBDA divided by revenue) of each of our consolidated reportable segments:

	Year ended December 31,		
	2019	2018 (a)	2017 (a)(b)
	%		
U.K./Ireland	42.4	43.6	43.9
Belgium	47.9	49.4	45.3
Switzerland	49.9	53.7	58.4
Central and Eastern Europe	45.2	47.5	47.4

(a) Amounts have been revised to reflect the retrospective impact of the Centrally-held Cost Allocation, as further described in note 20 to our consolidated financial statements.

(b) As further described in note 2 to our consolidated financial statements, we adopted ASU 2014-09 on January 1, 2018 using the cumulative effect transition method. In order to provide a more meaningful comparison, Adjusted OIBDA margins for 2017 are presented on a pro forma basis that gives effect to the adoption of ASU 2014-09 as if such adoption had occurred on January 1, 2017.

In addition to organic changes in the revenue, operating and SG&A expenses of our consolidated reportable segments, the Adjusted OIBDA margins presented above include the impact of acquisitions. For discussion of the factors contributing to the changes in the Adjusted OIBDA margins of our consolidated reportable segments, see the analysis of our revenue included in *Discussion and Analysis of our Reportable Segments* above and the analysis of our expenses included in *Discussion and Analysis of our Consolidated Operating Results* below.

Discussion and Analysis of our Consolidated Operating Results

General

For more detailed explanations of the changes in our revenue, see *Discussion and Analysis of our Reportable Segments* above.

2019 compared to 2018

Revenue

Our revenue by major category is set forth below:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2019	2018	\$	%	\$	%
in millions, except percentages						
Residential revenue:						
Residential cable revenue (a):						
Subscription revenue (b):						
Broadband internet	\$ 3,187.4	\$ 3,226.6	\$ (39.2)	(1.2)	\$ 105.9	3.3
Video	2,723.9	2,863.2	(139.3)	(4.9)	(18.5)	(0.6)
Fixed-line telephony	1,413.2	1,607.8	(194.6)	(12.1)	(129.8)	(8.1)
Total subscription revenue	7,324.5	7,697.6	(373.1)	(4.8)	(42.4)	(0.6)
Non-subscription revenue	198.1	279.1	(81.0)	(29.0)	(72.7)	(26.2)
Total residential cable revenue	7,522.6	7,976.7	(454.1)	(5.7)	(115.1)	(1.4)
Residential mobile revenue (c):						
Subscription revenue (b)	932.1	983.5	(51.4)	(5.2)	(7.3)	(0.7)
Non-subscription revenue	688.2	694.8	(6.6)	(0.9)	25.5	3.7
Total residential mobile revenue	1,620.3	1,678.3	(58.0)	(3.5)	18.2	1.1
Total residential revenue	9,142.9	9,655.0	(512.1)	(5.3)	(96.9)	(1.0)
B2B revenue (d):						
Subscription revenue	472.5	446.4	26.1	5.8	49.5	11.1
Non-subscription revenue	1,441.5	1,537.1	(95.6)	(6.2)	(50.0)	(3.3)
Total B2B revenue	1,914.0	1,983.5	(69.5)	(3.5)	(0.5)	—
Other revenue (e)						
Total	\$ 11,541.5	\$ 11,957.9	\$ (416.4)	(3.5)	\$ (87.2)	(0.7)

- (a) Residential cable subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential cable non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our cable and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices. Residential mobile interconnect revenue was \$247.4 million and \$253.6 million during 2019 and 2018, respectively.

- (d) B2B subscription revenue represents revenue from SOHO subscribers. SOHO subscribers pay a premium price to receive expanded service levels along with broadband internet, video, fixed-line telephony or mobile services that are the same or similar to the mass marketed products offered to our residential subscribers. A portion of the increases in our B2B subscription revenue is attributable to the conversion of certain residential subscribers to SOHO subscribers. B2B non-subscription revenue includes revenue from business broadband internet, video, fixed-line telephony, mobile and data services offered to medium to large enterprises and, on a wholesale basis, to other operators.
- (e) Other revenue includes, among other items, (i) revenue earned from the JV Services and the sale of customer premises equipment to the VodafoneZiggo JV, (ii) revenue earned from transitional and other services provided to various third parties and (iii) broadcasting revenue in Ireland.

Total revenue. Our consolidated revenue decreased \$416.4 million or 3.5% during 2019, as compared to 2018. This decrease includes an increase of \$105.9 million attributable to the impact of acquisitions. On an organic basis, our consolidated revenue decreased \$87.2 million or 0.7%.

Residential revenue. The details of the decrease in our consolidated residential revenue for 2019, as compared to 2018, are as follows (in millions):

Increase (decrease) in residential cable subscription revenue due to change in:	
Average number of RGUs	\$ (50.3)
ARPU	7.9
Decrease in residential cable non-subscription revenue	(72.7)
Total decrease in residential cable revenue	(115.1)
Decrease in residential mobile subscription revenue	(7.3)
Increase in residential mobile non-subscription revenue	25.5
Total organic decrease in residential revenue	(96.9)
Impact of acquisitions and disposals	(0.3)
Impact of FX	(414.9)
Total decrease in residential revenue	\$ (512.1)

On an organic basis, our consolidated residential cable subscription revenue decreased \$42.4 million or 0.6% during 2019, as compared to 2018. This decrease is attributable to the net effect of (i) a decrease from fixed-line telephony services of \$129.8 million or 8.1%, primarily attributable to lower ARPU, (ii) an increase from broadband internet services of \$105.9 million or 3.3%, attributable to higher ARPU and an increase in the average number of RGUs, and (iii) a decrease from video services of \$18.5 million or 0.6%, attributable to the net effect of a decrease in the average number of RGUs and higher ARPU.

On an organic basis, our consolidated residential cable non-subscription revenue decreased \$72.7 million or 26.2% during 2019, as compared to 2018. This decrease is primarily attributable to decreases in U.K./Ireland and Belgium.

On an organic basis, our consolidated residential mobile subscription revenue decreased \$7.3 million or 0.7% during 2019, as compared to 2018. This decrease is primarily due to a decrease in Belgium that was only partially offset by an increase in Switzerland and, to a lesser extent, U.K./Ireland.

On an organic basis, our consolidated residential mobile non-subscription revenue increased \$25.5 million or 3.7% during 2019, as compared to 2018. This increase is primarily due to an increase in revenue from sales of mobile handsets and other devices, as increases in Belgium and Switzerland were only partially offset by a decrease in U.K./Ireland. Mobile handset sales typically generate relatively low margins.

B2B revenue. On an organic basis, our consolidated B2B subscription revenue increased \$49.5 million or 11.1% during 2019, as compared to 2018. This increase is primarily due to increases in Belgium and U.K./Ireland.

On an organic basis, our consolidated B2B non-subscription revenue decreased \$50.0 million or 3.3% during 2019, as compared to 2018. This decrease is primarily due to decreases in Belgium and U.K./Ireland, partially offset by an increase in Switzerland.

Other revenue. On an organic basis, our consolidated other revenue increased \$10.2 million or 1.8% during 2019, as compared to 2018. This increase is primarily due to revenue earned from sales of customer premises equipment to the VodafoneZiggo JV, which began during the second quarter of 2018 and typically generate low margins.

Programming and other direct costs of services

Programming and other direct costs of services include programming and copyright costs, interconnect and access costs, costs of mobile handsets and other devices and other direct costs related to our operations. Programming and copyright costs represent a significant portion of our operating costs and are subject to rise in future periods due to various factors, including (i) higher costs associated with the expansion of our digital video content, including rights associated with ancillary product offerings and rights that provide for the broadcast of live sporting events and (ii) rate increases.

The details of our programming and other direct costs of services are as follows:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2019	2018	\$	%	\$	%
in millions, except percentages						
U.K./Ireland	\$ 2,058.3	\$ 2,101.3	\$ (43.0)	(2.0)	\$ 51.9	2.5
Belgium	694.5	680.5	14.0	2.1	(2.8)	(0.4)
Switzerland	265.9	253.0	12.9	5.1	17.9	7.1
Central and Eastern Europe	116.1	111.2	4.9	4.4	12.4	11.2
Central and Corporate	104.3	100.0	4.3	4.3	2.3	2.1
Intersegment eliminations	(0.4)	0.1	(0.5)	N.M.	(0.5)	N.M.
Total	\$ 3,238.7	\$ 3,246.1	\$ (7.4)	(0.2)	\$ 81.2	2.5

N.M. — Not Meaningful.

Our programming and other direct costs of services decreased \$7.4 million or 0.2% during 2019, as compared to 2018. This decrease includes an increase of \$55.0 million attributable to the impact of acquisitions. On an organic basis, our programming and other direct costs of services increased \$81.2 million or 2.5%. This increase includes the following factors:

- An increase in programming and copyright costs of \$54.5 million or 3.3% due to higher costs for certain premium and/or basic content, primarily due to increases in U.K./Ireland and Poland that were only partially offset by a decrease in Switzerland;
- The impact of the classification of costs associated with the delivery of certain transitional services provided by Central and Corporate to various third parties in connection with our recent dispositions. Beginning on the effective dates of the underlying agreements, these costs became direct costs of services, which resulted in an increase of \$34.1 million that was fully offset by a corresponding decrease in various other operating and SG&A expenses within Central and Corporate;
- An increase in mobile handset and other device costs of \$21.0 million or 5.6%, primarily due to the net effect of (i) higher sales volumes, as increases in Belgium and Switzerland were only partially offset by a decrease in U.K./Ireland, and (ii) a lower average cost per handset sold in U.K./Ireland; and
- An increase in interconnect and access costs of \$10.4 million or 1.2%, primarily due to (i) higher costs of \$5.3 million due to the impact of a credit recorded during the second quarter of 2018 in connection with a telecommunications operator's agreement to compensate communications providers, including Virgin Media, for certain contractual breaches related to network charges, (ii) higher lease and B2B data costs, primarily due to increases in Switzerland and U.K./Ireland that were only partially offset by a decrease in Belgium, (iii) higher MVNO costs, primarily in Switzerland, and (iv) higher interconnect and roaming costs, as increases in U.K./Ireland and Switzerland were only partially offset by a decrease in Belgium.

Other operating expenses

Other operating expenses include network operations, customer operations, customer care, share-based compensation and other costs related to our operations. We do not include share-based compensation in the following discussion and analysis of the other operating expenses of our consolidated reportable segments as share-based compensation expense is not included in the performance measures of our consolidated reportable segments. Share-based compensation expense is separately discussed further below.

The details of our other operating expenses are as follows:

	Year ended December 31,		Decrease		Organic increase (decrease)	
	2019	2018 (a)	\$	%	\$	%
in millions, except percentages						
U.K./Ireland	\$ 904.0	\$ 913.2	\$ (9.2)	(1.0)	\$ 33.6	3.7
Belgium	389.1	408.5	(19.4)	(4.7)	(1.1)	(0.3)
Switzerland	178.9	186.3	(7.4)	(4.0)	(5.7)	(3.0)
Central and Eastern Europe	70.9	72.8	(1.9)	(2.6)	2.9	4.0
Central and Corporate	102.2	125.5	(23.3)	(18.6)	(27.1)	(20.4)
Intersegment eliminations	(7.7)	6.5	(14.2)	N.M.	(14.2)	N.M.
Total other operating expenses excluding share-based compensation expense	1,637.4	1,712.8	(75.4)	(4.4)	\$ (11.6)	(0.7)
Share-based compensation expense	3.9	4.4	(0.5)	(11.4)		
Total	\$ 1,641.3	\$ 1,717.2	\$ (75.9)	(4.4)		

N.M. — Not Meaningful.

- (a) Amounts have been revised to reflect the retrospective impact of the Centrally-held Cost Allocation, as further described in note 20 to our consolidated financial statements.

Our other operating expenses (exclusive of share-based compensation expense) decreased \$75.4 million or 4.4% during 2019, as compared to 2018. This decrease includes an increase of \$3.4 million attributable to the impact of acquisitions. On an organic basis, our other operating expenses decreased \$11.6 million or 0.7%. This decrease includes the following factors:

- An increase in network infrastructure charges in U.K./Ireland of \$42.2 million following an increase in the rateable value of certain of Virgin Media's assets. For additional information, see "Other Regulatory Issues" in note 19 to our consolidated financial statements;
- A decrease in personnel costs of \$19.0 million or 3.7%, primarily due to the net effect of (i) lower staffing levels, primarily due to decreases in U.K./Ireland and Central and Corporate that were only partially offset by increases in Switzerland and Belgium, (ii) lower capitalizable labor activities, primarily in U.K./Ireland, (iii) a decrease in temporary personnel costs, primarily in U.K./Ireland, and (iv) higher average costs per employee, primarily due to an increase in U.K./Ireland that was only partially offset by decreases in Belgium and Switzerland; and
- A decrease in customer service costs of \$16.5 million or 5.9%, primarily due to the net effect of (i) lower call center costs, primarily in Belgium and U.K./Ireland, and (ii) an increase in customer premises equipment refurbishment, inventory management and other supply chain costs, primarily due to an increase in U.K./Ireland that was only partially offset by a decrease in Switzerland.

SG&A expenses

SG&A expenses include human resources, information technology, general services, management, finance, legal, external sales and marketing costs, share-based compensation and other general expenses. We do not include share-based compensation in the following discussion and analysis of the SG&A expenses of our consolidated reportable segments as share-based compensation expense is not included in the performance measures of our consolidated reportable segments. Share-based compensation expense is separately discussed further below.

The details of our SG&A expenses are as follows:

	Year ended December 31,		Increase (decrease)		Organic increase (decrease)	
	2019	2018 (a)	\$	%	\$	%
in millions, except percentages						
U.K./Ireland	\$ 837.5	\$ 865.1	\$ (27.6)	(3.2)	\$ 13.4	1.5
Belgium	423.3	424.6	(1.3)	(0.3)	(12.5)	(2.7)
Switzerland	186.1	174.7	11.4	6.5	14.1	8.0
Central and Eastern Europe	73.4	74.6	(1.2)	(1.6)	3.6	4.8
Central and Corporate	281.0	306.5	(25.5)	(8.3)	(15.8)	(5.2)
Intersegment eliminations	4.6	2.0	2.6	N.M.	2.6	N.M.
Total SG&A expenses excluding share-based compensation expense	1,805.9	1,847.5	(41.6)	(2.3)	\$ 5.4	0.3
Share-based compensation expense	301.9	201.6	100.3	49.8		
Total	\$ 2,107.8	\$ 2,049.1	\$ 58.7	2.9		

N.M. — Not Meaningful.

- (a) Amounts have been revised to reflect the retrospective impact of the Centrally-held Cost Allocation, as further described in note 20 to our consolidated financial statements.

Supplemental SG&A expense information:

	Year ended December 31,		Decrease		Organic increase (decrease)	
	2019	2018	\$	%	\$	%
in millions, except percentages						
General and administrative (a)	\$ 1,400.4	\$ 1,427.6	\$ (27.2)	(1.9)	\$ 4.8	0.3
External sales and marketing	405.5	419.9	(14.4)	(3.4)	0.6	0.1
Total	\$ 1,805.9	\$ 1,847.5	\$ (41.6)	(2.3)	\$ 5.4	0.3

- (a) General and administrative expenses include all personnel-related costs within our SG&A expenses, including personnel-related costs associated with our sales and marketing function.

Our SG&A expenses (exclusive of share-based compensation expense) decreased \$41.6 million or 2.3% during 2019, as compared to 2018. This decrease includes an increase of \$34.7 million attributable to the impact of acquisitions. On an organic basis, our SG&A expenses increased \$5.4 million or 0.3%. This increase includes the following factors:

- An increase in personnel costs of \$29.8 million or 3.7%, primarily due to the net effect of (i) higher incentive compensation costs, primarily in Central and Corporate, (ii) higher average costs per employee, primarily in U.K./Ireland, (iii) a decrease in temporary personnel costs, primarily due to decreases in Belgium and U.K./Ireland that were only partially offset by increases in Switzerland and Central and Corporate, and (iv) higher staffing levels, as increases in Belgium and Switzerland were only partially offset by decreases in U.K./Ireland and Central and Corporate. A portion of the higher average costs

per employee is attributable to higher severance costs in U.K./Ireland of \$6.7 million associated with revisions to our operating model and decreases in senior management personnel and a portion of the higher incentive compensation costs is attributable to an increase in Central and Corporate related to a \$5.0 million cash bonus associated with the renewal of an existing executive employment contract on similar terms;

- A decrease in business service and certain other costs of \$4.6 million or 2.5%, primarily due to the net effect of (i) lower costs of \$9.4 million due to the impact of a reassessment of an accrual in U.K./Ireland during 2018 and (ii) higher consulting costs, primarily due to an increase in Belgium that was only partially offset by a decrease in Central and Corporate; and
- A decrease in core network and information technology-related costs of \$4.4 million or 2.1%, primarily due to lower information technology-related expenses in U.K./Ireland, Central and Corporate and Switzerland that were only partially offset by an increase in Belgium.

Share-based compensation expense

Our share-based compensation expense primarily relates to the share-based incentive awards issued by Liberty Global to its employees and employees of its subsidiaries. A summary of our aggregate share-based compensation expense is set forth below:

	Year ended December 31,	
	2019	2018
	in millions	
Liberty Global:		
Performance-based incentive awards (a)	\$ 134.5	\$ 50.8
Non-performance based incentive awards (b)	107.6	90.1
Other (c)	39.0	43.4
Total Liberty Global	281.1	184.3
Telenet share-based incentive awards (d)	15.6	19.6
Other	9.1	2.1
Total	\$ 305.8	\$ 206.0
Included in:		
Other operating expenses	\$ 3.9	\$ 4.4
Total SG&A expenses	301.9	201.6
Total	\$ 305.8	\$ 206.0

- (a) Includes share-based compensation expense related to (i) PSUs and (ii) in 2019, (a) the 2019 Challenge Performance Awards and (b) the performance-based portion of the 2019 CEO Performance Award.
- (b) The 2019 amount includes share-based compensation expense related to the RSAs issued under the 2019 CEO Performance Award.
- (c) Represents annual incentive compensation and defined contribution plan liabilities that have been or are expected to be settled with Liberty Global ordinary shares. In the case of the annual incentive compensation, shares have been or will be issued to senior management and key employees pursuant to a shareholding incentive program that was implemented in the fourth quarter of 2017. The shareholding incentive program allows these employees to elect to receive up to 100% of their annual incentive compensation in ordinary shares of Liberty Global in lieu of cash.
- (d) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2019, included performance- and non-performance-based stock option awards with respect to 3,846,649 Telenet shares. These stock option awards had a weighted average exercise price of €43.82 (\$49.20).

For additional information concerning our share-based compensation, see note 15 to our consolidated financial statements.

Depreciation and amortization expense

Our depreciation and amortization expense was \$3,652.2 million and \$3,858.2 million during 2019 and 2018, respectively. Excluding the effects of FX, depreciation and amortization expense decreased \$33.2 million or 0.9% during 2019, as compared to 2018. This decrease is primarily due to the net effect of (i) a decrease associated with certain assets becoming fully depreciated, primarily in U.K./Ireland, Central and Corporate and Belgium, (ii) an increase associated with property and equipment additions related to the installation of customer premises equipment, the expansion and upgrade of our networks and other capital initiatives and (iii) a decrease due to accelerated depreciation in Belgium during 2018.

Impairment, restructuring and other operating items, net

We recognized impairment, restructuring and other operating items, net, of \$156.0 million during 2019, as compared to \$248.2 million during 2018.

The 2019 amount primarily includes (i) restructuring charges of \$89.9 million, including \$84.3 million of employee severance and termination costs related to certain reorganization activities, primarily in U.K./Ireland, Central and Corporate and Switzerland, (ii) a net provision for litigation of £41.3 million (\$54.0 million at the applicable rate) related to a VAT matter in the U.K. recorded during the fourth quarter of 2019, (iii) impairment charges of \$34.2 million, primarily related to the write-off of certain network assets in U.K./Ireland, and (iv) an aggregate credit related to direct acquisition and disposition costs of \$18.1 million, primarily related to the net effect of (a) a \$50.4 million cash termination fee received from Sunrise Communications Group AG (**Sunrise**) during the fourth quarter in connection with the termination of a share purchase agreement to sell our operations in Switzerland (the **Sunrise SPA**) and (b) costs incurred in connection with (1) the sales of the Vodafone Disposal Group and UPC DTH and (2) the Sunrise SPA.

The 2018 amount primarily includes (i) restructuring charges of \$96.4 million, including (a) \$42.2 million of employee severance and termination costs related to certain reorganization activities, primarily in U.K./Ireland and Central and Corporate, and (b) \$40.5 million in Belgium related to the migration of Telenet's mobile subscribers from an MVNO arrangement to Telenet's mobile network, and (ii) a provision for litigation of \$83.1 million related to a VAT matter in the U.K. recorded during the third quarter of 2018. For additional information regarding Telenet's exit from its MVNO arrangement, see note 16 to our consolidated financial statements.

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

For additional information regarding the aforementioned VAT matters in the U.K., see note 19 to our consolidated financial statements. For additional information regarding our restructuring charges, see note 16 to our consolidated financial statements. For additional information regarding our impairments, see *Critical Accounting Policies, Judgments and Estimates — Impairment of Property and Equipment and Intangible Assets* below.

Interest expense

We recognized interest expense of \$1,385.9 million and \$1,478.7 million during 2019 and 2018, respectively. Excluding the effects of FX, interest expense decreased \$31.1 million or 2.1% during 2019, as compared to 2018. This decrease is primarily attributable to a lower average outstanding debt balance, partially offset by a slightly higher weighted average interest rate. For additional information regarding our outstanding indebtedness, see note 11 to our consolidated financial statements.

It is possible that the interest rates on (i) any new borrowings could be higher than the current interest rates on our existing indebtedness and (ii) our variable-rate indebtedness could increase in future periods. As further discussed in note 8 to our consolidated financial statements and under *Qualitative and Quantitative Disclosures about Market Risk* below, we use derivative instruments to manage our interest rate risks.

Realized and unrealized gains (losses) on derivative instruments, net

Our realized and unrealized gains or losses on derivative instruments include (i) unrealized changes in the fair values of our derivative instruments that are non-cash in nature until such time as the derivative contracts are fully or partially settled and (ii) realized gains or losses upon the full or partial settlement of the derivative contracts. The details of our realized and unrealized gains (losses) on derivative instruments, net, are as follows:

	Year ended December 31,	
	2019	2018
in millions		
Cross-currency and interest rate derivative contracts (a)	\$ (207.3)	\$ 905.8
Equity-related derivative instruments:		
ITV Collar	(84.4)	176.7
Lionsgate Forward	13.0	30.1
Sumitomo Collar	—	(11.8)
Other	8.0	2.5
Total equity-related derivative instruments (b)	(63.4)	197.5
Foreign currency forward and option contracts	77.4	22.7
Other	1.3	(0.2)
Total	\$ (192.0)	\$ 1,125.8

- (a) The loss during 2019 is attributable to (i) a net loss associated with changes in certain market interest rates and (ii) a net loss associated with changes in the relative value of certain currencies. In addition, the loss during 2019 includes a net gain of \$16.6 million resulting from changes in our credit risk valuation adjustments. The gain during 2018 is primarily attributable to the net effect of (a) a net gain associated with changes in the relative value of certain currencies and (b) a net loss associated with changes in certain market interest rates. In addition, the gain during 2018 includes a net loss of \$71.1 million resulting from changes in our credit risk valuation adjustments.
- (b) For information concerning the factors that impact the valuations of our equity-related derivative instruments, see note 9 to our consolidated financial statements.

For additional information concerning our derivative instruments, see notes 8 and 9 to our consolidated financial statements and *Quantitative and Qualitative Disclosures about Market Risk* below.

Foreign currency transaction gains (losses), net

Our foreign currency transaction gains or losses primarily result from the remeasurement of monetary assets and liabilities that are denominated in currencies other than the underlying functional currency of the applicable entity. Unrealized foreign currency transaction gains or losses are computed based on period-end exchange rates and are non-cash in nature until such time as the amounts are settled. The details of our foreign currency transaction gains (losses), net, are as follows:

	Year ended December 31,	
	2019	2018
in millions		
U.S. dollar denominated debt issued by British pound sterling functional currency entities	\$ 215.6	\$ (258.0)
Intercompany payables and receivables denominated in a currency other than the entity's functional currency (a)	(116.7)	494.3
U.S. dollar denominated debt issued by euro functional currency entities	(110.3)	(222.1)
British pound sterling denominated debt issued by a U.S. dollar functional currency entity	(51.3)	83.3
Euro denominated debt issued by British pound sterling functional currency entities	(30.3)	5.3
Other	(1.8)	(12.4)
Total	\$ (94.8)	\$ 90.4

- (a) Amounts primarily relate to (i) loans between certain of our non-operating and operating subsidiaries in Europe, which generally are denominated in the currency of the applicable operating subsidiary and (ii) loans between certain of our non-operating subsidiaries in the U.S. and Europe.

For information regarding how we manage our exposure to foreign currency risk, see *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net

Our realized and unrealized gains or losses due to changes in fair values of certain investments and debt include unrealized gains or losses associated with changes in fair values that are non-cash in nature until such time as these gains or losses are realized through cash transactions. For additional information regarding our investments, fair value measurements and debt, see notes 7, 9 and 11, respectively, to our consolidated financial statements. The details of our realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net, are as follows:

	Year ended December 31,	
	2019	2018
in millions		
Investments:		
ITV	\$ 163.9	\$ (257.8)
Lionsgate	(25.0)	(86.4)
Casa	(24.2)	(9.2)
ITI Neovision	2.7	(24.9)
Other, net	(18.4)	(14.9)
Total investments	99.0	(393.2)
Debt	(27.0)	8.7
Total	\$ 72.0	\$ (384.5)

Losses on debt modification and extinguishment, net

We recognized net losses on debt modification and extinguishment of \$216.7 million and \$65.0 million during 2019 and 2018, respectively.

The loss during 2019 is primarily attributable to (i) the payment of \$172.2 million of redemption premiums and (ii) the write-off of \$42.5 million of net unamortized deferred financing costs, discounts and premiums.

The loss during 2018 is primarily attributable to the net effect of (i) the payment of \$49.5 million of redemption premiums, (ii) the write-off of \$28.2 million of net unamortized deferred financing costs and discounts and (iii) a gain associated with the settlement of the final tranche of the Sumitomo Collar, as described in note 8 to our consolidated financial statements.

For additional information concerning our losses on debt modification and extinguishment, net, see note 11 to our consolidated financial statements.

Share of results of affiliates, net

The following table sets forth the details of our share of results of affiliates, net:

	Year ended December 31,	
	2019	2018
	in millions	
VodafoneZiggo JV (a)	\$ (185.9)	\$ 11.4
All3Media	(8.8)	(19.2)
Formula E	1.7	(0.2)
Other	(5.5)	(0.7)
Total	<u>\$ (198.5)</u>	<u>\$ (8.7)</u>

- (a) Amounts include the net effect of (i) interest income of \$50.4 million and \$59.6 million, respectively, representing 100% of the interest earned on the VodafoneZiggo JV Receivable and (ii) our 50% share of the remaining results of operations of the VodafoneZiggo JV. The summarized results of operations of the VodafoneZiggo JV are set forth below:

	Year ended December 31,	
	2019	2018
	in millions	
Revenue	\$ 4,407.8	\$ 4,602.2
Adjusted OIBDA	\$ 1,987.7	\$ 2,009.7
Operating income (1)	\$ 119.1	\$ 130.6
Non-operating expense (2)	\$ (631.6)	\$ (598.4)
Net loss	<u>\$ (470.0)</u>	<u>\$ (91.6)</u>

- (1) Includes depreciation and amortization of \$1,822.1 million and \$1,833.6 million, respectively.

- (2) Includes interest expense of \$647.3 million and \$678.3 million, respectively.

The VodafoneZiggo JV is experiencing significant competition. In particular, the mobile operations of the VodafoneZiggo JV continue to experience competitive pressure on pricing. In light of this competition, as well as regulatory and economic factors, we could conclude in future periods that our investment in the VodafoneZiggo JV is impaired or management of the VodafoneZiggo JV could conclude that an impairment of the VodafoneZiggo JV's goodwill and, to a lesser extent, long-lived assets, is required. Any such impairment of the VodafoneZiggo JV's goodwill or our investment in the VodafoneZiggo JV would be reflected as a component of share of results of affiliates, net, in our consolidated statement of operations. Our share of any such impairment charges could be significant.

For additional information regarding our equity method investments, see note 7 to our consolidated financial statements.

Other income, net

We recognized other income, net, of \$114.4 million and \$43.4 million during 2019 and 2018, respectively. These amounts include (i) interest and dividend income of \$77.8 million and \$13.4 million, respectively, (ii) for 2019, a \$25.7 million gain associated with the De Vijver Media Acquisition, representing the difference between the fair value and carrying amount of our then-existing 50% ownership interest in De Vijver Media, and (iii) credits related to the non-service components of our net periodic pension cost of \$12.7 million and \$18.1 million, respectively. In addition, other income, net, for 2018 includes a \$12.3 million gain related to the formation of a joint venture in Belgium, representing the excess of the fair value of our ownership interest in the joint venture over the carrying value of the assets that we contributed.

Income tax expense

We recognized income tax expense of \$253.0 million and \$1,573.3 million during 2019 and 2018, respectively.

The income tax expense during 2019 differs from the expected income tax benefit of \$219.6 million (based on the U.K. statutory income tax rate of 19.0%) primarily due to the negative impact of (i) certain permanent differences between the financial and tax accounting treatment of (a) interest and other items and (b) items associated with investments in subsidiaries, and (ii) a net increase in valuation allowances.

The income tax expense during 2018 differs from the expected income tax expense of \$30.7 million (based on the U.K. statutory income tax rate of 19.0%) primarily due to the net negative impact of (i) the Mandatory Repatriation Tax and (ii) certain permanent differences between the financial and tax accounting treatment of (a) items associated with investments in subsidiaries and (b) interest and other items. The net negative impact of these items was partially offset by the net positive impact of non-deductible or non-taxable foreign currency exchange results.

For additional information concerning our income taxes, see note 13 to our consolidated financial statements.

Loss from continuing operations

During 2019 and 2018, we reported losses from continuing operations of \$1,409.0 million and \$1,411.5 million, respectively, consisting of (i) operating income of \$745.5 million and \$839.1 million, respectively, (ii) net non-operating expense of \$1,901.5 million and \$677.3 million, respectively, and (iii) income tax expense of \$253.0 million and \$1,573.3 million, respectively.

Gains or losses associated with (i) changes in the fair values of derivative instruments, (ii) movements in foreign currency exchange rates and (iii) the disposition of assets and changes in ownership are subject to a high degree of volatility and, as such, any gains from these sources do not represent a reliable source of income. In the absence of significant gains in the future from these sources or from other non-operating items, our ability to achieve earnings is largely dependent on our ability to increase our aggregate Adjusted OIBDA to a level that more than offsets the aggregate amount of our (a) share-based compensation expense, (b) depreciation and amortization, (c) impairment, restructuring and other operating items, (d) interest expense, (e) other non-operating expenses and (f) income tax expenses.

Due largely to the fact that we seek to maintain our debt at levels that provide for attractive equity returns, as discussed under *Material Changes in Financial Condition — Capitalization* below, we expect that we will continue to report significant levels of interest expense for the foreseeable future. For information concerning our expectations with respect to trends that may affect certain aspects of our operating results in future periods, see the discussion under *Overview* above. For information concerning the reasons for changes in specific line items in our consolidated statements of operations, see *Discussion and Analysis of our Reportable Segments and Discussion and Analysis of our Consolidated Operating Results* above.

Earnings from discontinued operations, net of taxes

We reported earnings from discontinued operations, net of taxes, of \$730.3 million and \$1,163.4 million during 2019 and 2018, respectively, related to the operations of the Vodafone Disposal Group, UPC DTH and, for 2018, UPC Austria. In addition, we recognized a gain of \$12.2 billion related to the third quarter 2019 sale of the Vodafone Disposal Group, a gain of \$106.0 million related to the second quarter 2019 sale of UPC DTH and a gain of \$1,098.1 million related to the third quarter 2018 sale of UPC Austria. For additional information, see note 6 to our consolidated financial statements.

Net earnings attributable to noncontrolling interests

Net earnings attributable to noncontrolling interests includes the noncontrolling interests' share of the results of our continuing and discontinued operations. Our net earnings attributable to noncontrolling interests were \$116.8 million and \$124.7 million during 2019 and 2018, respectively. The decrease is primarily attributable to the impact of the sale of UPC Austria and the results of operations of Telenet.

2018 compared to 2017

For information regarding the changes in our (i) programming and other direct costs of services, (ii) other operating expenses and (iii) SG&A expenses during 2018, as compared to 2017, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2018 10-K.

Liquidity and Capital Resources

Sources and Uses of Cash

We are a holding company that is dependent on the capital resources of our subsidiaries to satisfy our liquidity requirements at the corporate level. Each of our significant operating subsidiaries is separately financed within one of our three subsidiary "borrowing groups." These borrowing groups include the respective restricted parent and subsidiary entities within Telenet, Virgin Media and UPC Holding. Although our borrowing groups typically generate cash from operating activities, the terms of the instruments governing the indebtedness of these borrowing groups may restrict our ability to access the liquidity of these subsidiaries. In addition, our ability to access the liquidity of these and other subsidiaries may be limited by tax and legal considerations, the presence of noncontrolling interests and other factors.

Cash and cash equivalents

The details of the U.S. dollar equivalent balances of our consolidated cash and cash equivalents at December 31, 2019 are set forth in the following table (in millions):

Cash and cash equivalents held by:	
Liberty Global and unrestricted subsidiaries:	
Liberty Global (a)	\$ 6.7
Unrestricted subsidiaries (b)	7,951.2
Total Liberty Global and unrestricted subsidiaries	<u>7,957.9</u>
Borrowing groups (c):	
Telenet	114.0
Virgin Media (d)	45.7
UPC Holding	24.8
Total borrowing groups	<u>184.5</u>
Total cash and cash equivalents	<u>\$ 8,142.4</u>

(a) Represents the amount held by Liberty Global on a standalone basis.

(b) Represents the aggregate amount held by subsidiaries that are outside of our borrowing groups.

- (c) Except as otherwise noted, represents the aggregate amounts held by the parent entity and restricted subsidiaries of our borrowing groups.
- (d) The Virgin Media borrowing group includes certain subsidiaries of Virgin Media, but excludes the parent entity, Virgin Media Inc.

Liquidity of Liberty Global and its unrestricted subsidiaries

The \$6.7 million of cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, the \$7,951.2 million of aggregate cash and cash equivalents held by unrestricted subsidiaries, represented available liquidity at the corporate level at December 31, 2019. Our remaining cash and cash equivalents of \$184.5 million at December 31, 2019 were held by our borrowing groups, as set forth in the table above. As noted above, various factors may limit our ability to access the cash of our borrowing groups. For information regarding certain limitations imposed by our subsidiaries' debt instruments at December 31, 2019, see note 11 to our consolidated financial statements.

Our current sources of corporate liquidity include (i) cash and cash equivalents held by Liberty Global and, subject to certain tax and legal considerations, Liberty Global's unrestricted subsidiaries, (ii) interest and dividend income received on our and, subject to certain tax and legal considerations, our unrestricted subsidiaries' cash and cash equivalents and investments, including dividends received from the VodafoneZiggo JV, (iii) principal and interest payments received with respect to the VodafoneZiggo JV Receivable and (iv) cash received with respect to transitional and other services provided to various third parties and the VodafoneZiggo JV.

From time to time, Liberty Global and its unrestricted subsidiaries may also receive (i) proceeds in the form of distributions or loan repayments from Liberty Global's borrowing groups or affiliates (including amounts from the VodafoneZiggo JV) upon (a) the completion of recapitalizations, refinancings, asset sales or similar transactions by these entities or (b) the accumulation of excess cash from operations or other means, (ii) proceeds upon the disposition of investments and other assets of Liberty Global and its unrestricted subsidiaries and (iii) proceeds in connection with the incurrence of debt by Liberty Global or its unrestricted subsidiaries or the issuance of equity securities by Liberty Global, including equity securities issued to satisfy subsidiary obligations. No assurance can be given that any external funding would be available to Liberty Global or its unrestricted subsidiaries on favorable terms, or at all. For information regarding the liquidity impacts of the disposition of the Vodafone Disposal Group, see note 6 to our consolidated financial statements.

At December 31, 2019, our consolidated cash and cash equivalents balance included \$8,108.2 million held by entities that are domiciled outside of the U.K. Based on our assessment of our ability to access the liquidity of our subsidiaries on a tax efficient basis and our expectations with respect to our corporate liquidity requirements, we do not anticipate that tax considerations will adversely impact our corporate liquidity over the next 12 months. Our ability to access the liquidity of our subsidiaries on a tax efficient basis is a consideration in assessing the extent of any current or future share repurchase programs.

In addition, the amount of cash we receive from our subsidiaries to satisfy U.S. dollar-denominated liquidity requirements is impacted by fluctuations in exchange rates, particularly with regard to the translation of British pounds sterling and euros into U.S. dollars. In this regard, the strengthening (weakening) of the U.S. dollar against these currencies will result in decreases (increases) in the U.S. dollars received from the applicable subsidiaries to fund the repurchase of our equity securities and other U.S. dollar-denominated liquidity requirements.

Our corporate liquidity requirements include (i) corporate general and administrative expenses, (ii) interest payments on the TV Collar Loan and (iii) principal payments on the ITV Collar Loan and the Lionsgate Loan to the extent not settled through the delivery of the underlying shares. In addition, Liberty Global and its unrestricted subsidiaries may require cash in connection with (a) the repayment of third-party and intercompany debt, (b) the satisfaction of contingent liabilities, (c) acquisitions, (d) the repurchase of equity and debt securities, (e) other investment opportunities, (f) any funding requirements of our subsidiaries and affiliates or (g) income tax payments. In addition, our parent entity uses available liquidity to make interest and principal payments on notes payable to certain of our unrestricted subsidiaries (aggregate outstanding principal of \$11.9 billion at December 31, 2019 with varying maturity dates). For information regarding our commitments and contingencies, see note 19 to our consolidated financial statements.

During 2019, the aggregate amount of our share repurchases, including repurchases made pursuant to modified Dutch auction cash tenders and direct acquisition costs, was \$3,220.2 million. At December 31, 2019, the remaining amount authorized for share repurchases was \$66.4 million. In February 2020, our board of directors authorized an additional \$1.0 billion for share repurchases. As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our Distributable

Reserves. For additional information regarding our share repurchase programs and Distributable Reserves, see note 14 to our consolidated financial statements.

Liquidity of borrowing groups

The cash and cash equivalents of our borrowing groups are detailed in the table above. In addition to cash and cash equivalents, the primary sources of liquidity of our borrowing groups are cash provided by operations and borrowing availability under their respective debt instruments. For the details of the borrowing availability of our borrowing groups at December 31, 2019, see note 11 to our consolidated financial statements. The aforementioned sources of liquidity may be supplemented in certain cases by contributions and/or loans from Liberty Global and its unrestricted subsidiaries. The liquidity of our borrowing groups generally is used to fund property and equipment additions, debt service requirements and income tax payments. From time to time, our borrowing groups may also require liquidity in connection with (i) acquisitions and other investment opportunities, (ii) loans to Liberty Global, (iii) capital distributions to Liberty Global and other equity owners or (iv) the satisfaction of contingent liabilities. No assurance can be given that any external funding would be available to our borrowing groups on favorable terms, or at all. For information regarding our commitments and contingencies, see note 19 to our consolidated financial statements.

For additional information regarding our consolidated cash flows, see the discussion under *Consolidated Statements of Cash Flows* below.

Capitalization

We seek to maintain our debt at levels that provide for attractive equity returns without assuming undue risk. In this regard, we generally seek to cause our operating subsidiaries to maintain their debt at levels that result in a consolidated debt balance (excluding the ITV Collar Loan and Lionsgate Loan and measured using subsidiary debt figures at swapped foreign currency exchange rates, consistent with the covenant calculation requirements of our subsidiary debt agreements) that is between four and five times our consolidated Adjusted OIBDA, although the timing of our acquisitions and financing transactions and the interplay of average and spot foreign currency rates may impact this ratio. The ratio of our December 31, 2019 consolidated debt to our consolidated Adjusted OIBDA for the last twelve months was 5.4x. In addition, the ratio of our December 31, 2019 consolidated net debt (debt, as defined above, less cash and cash equivalents) to our consolidated Adjusted OIBDA for the last twelve months was 3.7x. Prior to December 31, 2019, we presented our debt and net debt ratios based on our annualized consolidated Adjusted OIBDA for the most recent quarter. Under this approach, our debt and net debt ratios were 5.2x and 3.6x, respectively.

Our ability to service or refinance our debt and to maintain compliance with the leverage covenants in the credit agreements and indentures of our borrowing groups is dependent primarily on our ability to maintain or increase the Adjusted OIBDA of our operating subsidiaries and to achieve adequate returns on our property and equipment additions and acquisitions. In addition, our ability to obtain additional debt financing is limited by the incurrence-based leverage covenants contained in the various debt instruments of our borrowing groups. For example, if the Adjusted OIBDA of one of our borrowing groups were to decline, our ability to obtain additional debt could be limited. At December 31, 2019, each of our borrowing groups was in compliance with its debt covenants. In addition, we do not anticipate any instances of non-compliance with respect to the debt covenants of our borrowing groups that would have a material adverse impact on our liquidity during the next 12 months.

At December 31, 2019, the outstanding principal amount of our consolidated debt, together with our finance lease obligations, aggregated \$28.3 billion, including \$3.9 billion that is classified as current on our consolidated balance sheet and \$20.7 billion that is not due until 2025 or thereafter. All of our consolidated debt and finance lease obligations have been borrowed or incurred by our subsidiaries at December 31, 2019. For additional information concerning our debt and finance lease maturities, see notes 11 and 12, respectively, to our consolidated financial statements.

We believe we have sufficient resources to repay or refinance the current portion of our debt and finance lease obligations and to fund our foreseeable liquidity requirements during the next 12 months. However, as our maturing debt grows in later years, we anticipate we will seek to refinance or otherwise extend our debt maturities. No assurance can be given that we will be able to complete these refinancing transactions or otherwise extend our debt maturities. In this regard, it is not possible to predict how political and economic conditions, sovereign debt concerns or any adverse regulatory developments could impact the credit and equity markets we access and, accordingly, our future liquidity and financial position. Our ability to access debt financing on favorable terms, or at all, could be adversely impacted by (i) the financial failure of any of our counterparties, which could (a) reduce amounts available under committed credit facilities and (b) adversely impact our ability to access cash deposited with any failed financial institution and (ii) tightening of the credit markets. In addition, any weakness in the equity markets could make it less attractive to use our shares to satisfy contingent or other obligations, and sustained or increased competition, particularly in combination with adverse economic or regulatory developments, could have an unfavorable impact on our cash flows and liquidity.

For additional information concerning our debt and finance lease obligations, see notes 11 and 12, respectively, to our consolidated financial statements.

Consolidated Statements of Cash Flows

General. Our cash flows are subject to significant variations due to FX. See related discussion under *Quantitative and Qualitative Disclosures about Market Risk — Foreign Currency Risk* below.

Consolidated Statements of Cash Flows — 2019 compared to 2018

Summary. The 2019 and 2018 consolidated statements of cash flows of our continuing operations are summarized as follows:

	Year ended December 31,		Change
	2019	2018	
	in millions		
Net cash provided by operating activities	\$ 3,714.1	\$ 3,985.0	\$ (270.9)
Net cash provided by investing activities	9,541.0	601.5	8,939.5
Net cash used by financing activities	(6,922.3)	(6,286.6)	(635.7)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	0.4	(43.2)	43.6
Net increase (decrease) in cash and cash equivalents and restricted cash	<u>\$ 6,333.2</u>	<u>\$ (1,743.3)</u>	<u>\$ 8,076.5</u>

Operating Activities. The decrease in net cash provided by our operating activities is primarily attributable to the net effect of (i) a decrease in the reported cash provided by operating activities due to FX, (ii) an increase in the cash provided by our Adjusted OIBDA and related working capital items, (iii) a decrease in cash provided due to higher payments of interest, (iv) a decrease in cash provided due to higher payments for taxes, (v) a decrease in cash provided due to lower cash dividends received and (vi) a decrease in cash provided due to lower cash receipts related to derivative instruments.

Investing Activities. The increase in net cash provided by our investing activities is primarily attributable to the net effect of (i) an increase in cash provided of \$9,144.9 million as a result of higher net cash proceeds received from the sale of discontinued operations, (ii) a decrease in cash provided of \$295.2 million as a result of cash used to fund the Vodafone Escrow Accounts and (iii) an increase in cash provided of \$209.9 million due to lower capital expenditures. Capital expenditures decreased from \$1,453.0 million during 2018 to \$1,243.1 million during 2019 due to (a) a decrease in our net local currency capital expenditures and related working capital movements, including the impact of lower capital-related vendor financing, and (b) a decrease due to FX.

The capital expenditures we report in our consolidated statements of cash flows do not include amounts that are financed under capital-related vendor financing or finance lease arrangements. Instead, these amounts are reflected as non-cash additions to our property and equipment when the underlying assets are delivered and as repayments of debt when the principal is repaid. In this discussion, we refer to (i) our capital expenditures as reported in our consolidated statements of cash flows, which exclude amounts financed under capital-related vendor financing or finance lease arrangements, and (ii) our total property and equipment additions, which include our capital expenditures on an accrual basis and amounts financed under capital-related vendor financing or finance lease arrangements. For further details regarding our property and equipment additions, see note 20 to our consolidated financial statements. A reconciliation of our consolidated property and equipment additions to our consolidated capital expenditures, as reported in our consolidated statements of cash flows, is set forth below:

	Year ended December 31,	
	2019	2018
	in millions	
Property and equipment additions	\$ 2,880.5	\$ 3,705.6
Assets acquired under capital-related vendor financing arrangements	(1,727.0)	(2,175.5)
Assets acquired under finance leases	(66.9)	(102.4)
Changes in current liabilities related to capital expenditures	156.5	25.3
Capital expenditures, net	<u>\$ 1,243.1</u>	<u>\$ 1,453.0</u>
Capital expenditures, net:		
Third-party payments	\$ 1,323.9	\$ 1,552.7
Proceeds received for transfers to related parties (a)	(80.8)	(99.7)
Total capital expenditures, net	<u>\$ 1,243.1</u>	<u>\$ 1,453.0</u>

- (a) Primarily relates to transfers of centrally-procured property and equipment to our discontinued operations and the VodafoneZiggo JV.

The decrease in our property and equipment additions during 2019 is due to (i) a decrease in local currency expenditures of our subsidiaries, due to decreases in (a) expenditures for the purchase and installation of customer premises equipment, (b) expenditures to support new customer products and operational efficiency initiatives, (c) baseline expenditures, including network improvements and expenditures for property and facilities and information technology systems, and (d) expenditures for new build and upgrade projects, and (ii) a decrease due to FX. During 2019 and 2018, our property and equipment additions represented 25.0% and 31.0% of revenue, respectively.

We expect our 2020 property and equipment additions to decline as compared to our 2019 property and equipment additions. The actual amount of our 2020 property and equipment additions may vary from our expectations for a variety of reasons, including (i) changes in (a) the competitive or regulatory environment, (b) business plans, (c) our expected future operating results or (d) foreign currency exchange rates and (ii) the availability of sufficient capital. Accordingly, no assurance can be given that our actual property and equipment additions will not vary materially from our expectations.

Financing Activities. The increase in net cash used by our financing activities is primarily attributable to the net effect of (i) an increase in cash used of \$1,209.5 million due to higher repurchases of Liberty Global ordinary shares, (ii) a decrease in cash used of \$257.7 million related to lower distributions by subsidiaries to noncontrolling interests and (iii) a decrease in cash used of \$218.7 million due to higher cash receipts related to derivative instruments.

Consolidated Statements of Cash Flows — 2018 compared to 2017

For information regarding (i) the consolidated statements of cash flows of our continuing operations for 2018, as compared to 2017, and (ii) our adjusted free cash flow for 2017, see *Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations* included in Part II of our 2018 10-K.

Adjusted Free Cash Flow

We define adjusted free cash flow as net cash provided by the operating activities of our continuing operations, plus (i) cash payments for third-party costs directly associated with successful and unsuccessful acquisitions and dispositions and (ii) expenses financed by an intermediary, less (a) capital expenditures, as reported in our consolidated statements of cash flows, (b) principal payments on amounts financed by vendors and intermediaries and (c) principal payments on finance leases (exclusive of the portions of the network lease in Belgium that we assumed in connection with an acquisition), with each item excluding any cash provided or used by our discontinued operations. We believe our presentation of adjusted free cash flow provides useful information to our investors because this measure can be used to gauge our ability to service debt and fund new investment opportunities. Adjusted free cash flow, which is a non-GAAP measure, should not be understood to represent our ability to fund discretionary amounts, as we have various mandatory and contractual obligations, including debt repayments, that are not deducted to arrive at this amount. Investors should view adjusted free cash flow as a supplement to, and not a substitute for, GAAP measures of liquidity included in our consolidated statements of cash flows.

The following table provides the details of our adjusted free cash flow:

	Year ended December 31,	
	2019	2018
	in millions	
Net cash provided by operating activities of our continuing operations (a)	\$ 3,714.1	\$ 3,985.0
Cash payments (receipts) for direct acquisition and disposition costs (b)	(13.5)	23.0
Expenses financed by an intermediary (c)	2,171.4	1,883.7
Capital expenditures, net	(1,243.1)	(1,453.0)
Principal payments on amounts financed by vendors and intermediaries	(3,934.7)	(4,258.0)
Principal payments on certain finance leases	(62.9)	(72.9)
Adjusted free cash flow	<u>\$ 631.3</u>	<u>\$ 107.8</u>

- (a) Amounts include interest payments related to debt that has been repaid in connection with the completion of the dispositions of the Vodafone Disposal Group and, for 2018, UPC Austria. These interest payments have not been allocated to discontinued operations.
- (b) The 2019 amount includes an adjustment to exclude from adjusted free cash flow a \$50.4 million cash receipt associated with a termination fee received from Sunrise during the fourth quarter in connection with the termination of the Sunrise SPA.
- (c) For purposes of our consolidated statements of cash flows, expenses financed by an intermediary are treated as hypothetical operating cash outflows and hypothetical financing cash inflows when the expenses are incurred. When we pay the financing intermediary, we record financing cash outflows in our consolidated statements of cash flows. For purposes of our adjusted free cash flow definition, we add back the hypothetical operating cash outflow when these financed expenses are incurred and deduct the financing cash outflows when we pay the financing intermediary.

Contractual Commitments

The following table sets forth the U.S. dollar equivalents of our commitments as of December 31, 2019:

	Payments due during:							Total
	2020	2021	2022	2023	2024	Thereafter		
	in millions							
Debt (excluding interest)	\$ 3,796.9	\$ 1,791.3	\$ 652.8	\$ 184.4	\$ 799.4	\$ 20,423.3	\$ 27,648.1	
Finance leases (excluding interest)	81.4	72.5	74.6	76.2	37.5	274.9	617.1	
Operating leases	126.6	98.1	81.0	68.5	56.7	203.6	634.5	
Programming commitments	1,165.0	887.4	355.3	17.5	14.2	30.4	2,469.8	
Network and connectivity commitments	715.3	313.3	98.3	46.9	39.9	736.1	1,949.8	
Purchase commitments	668.0	181.5	60.8	35.9	17.3	25.1	988.6	
Other commitments	30.0	3.4	2.0	0.3	0.3	1.0	37.0	
Total (a)	\$ 6,583.2	\$ 3,347.5	\$ 1,324.8	\$ 429.7	\$ 965.3	\$ 21,694.4	\$ 34,344.9	
Projected cash interest payments on debt and finance lease obligations (b)	\$ 1,226.0	\$ 1,147.5	\$ 1,095.2	\$ 1,076.3	\$ 1,036.7	\$ 2,947.2	\$ 8,528.9	

- (a) The commitments included in this table do not reflect any liabilities that are included on our December 31, 2019 consolidated balance sheet other than debt and lease obligations. Our liability for uncertain tax positions in the various jurisdictions in which we operate (\$572.0 million at December 31, 2019) has been excluded from the table as the amount and timing of any related payments are not subject to reasonable estimation.
- (b) Amounts are based on interest rates, interest payment dates, commitment fees and contractual maturities in effect as of December 31, 2019. These amounts are presented for illustrative purposes only and will likely differ from the actual cash payments required in future periods. In addition, the amounts presented do not include the impact of our interest rate derivative contracts, deferred financing costs, original issue premiums or discounts.

For information concerning our debt obligations, finance and operating lease liabilities and commitments, see notes 11, 12 and 19, respectively, to our consolidated financial statements.

In addition to the commitments set forth in the table above, we have significant commitments under (i) derivative instruments and (ii) defined benefit plans and similar agreements, pursuant to which we expect to make payments in future periods. For information regarding projected cash flows associated with these derivative instruments, see *Item 7A. Quantitative and Qualitative Disclosures about Market Risk — Projected Cash Flows Associated with Derivative Instruments* below. For information regarding our derivative instruments, including the net cash paid or received in connection with these instruments during 2019, 2018 and 2017, see note 8 to our consolidated financial statements. For information regarding our defined benefit plans, see note 7 to our consolidated financial statements.

Critical Accounting Policies, Judgments and Estimates

In connection with the preparation of our consolidated financial statements, we make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expenses and related disclosure of contingent assets and liabilities. Critical accounting policies are defined as those policies that are reflective of significant judgments, estimates and uncertainties, which would potentially result in materially different results under different assumptions and conditions. We believe the following accounting policies are critical in the preparation of our consolidated financial statements because of the judgment necessary to account for these matters and the significant estimates involved, which are susceptible to change:

- Impairment of property and equipment and intangible assets (including goodwill);
- Costs associated with construction and installation activities;
- Fair value measurements; and
- Income tax accounting.

We have discussed the selection of the aforementioned critical accounting policies with the audit committee of our board of directors. For additional information concerning our significant accounting policies, see note 3 to our consolidated financial statements.

Impairment of Property and Equipment and Intangible Assets

Carrying Value. The aggregate carrying value of our property and equipment and intangible assets (including goodwill) that was held for use comprised 58.0% of our total assets at December 31, 2019.

When circumstances warrant, we review the carrying amounts of our property and equipment and our intangible assets (other than goodwill and other indefinite-lived intangible assets) to determine whether such carrying amounts continue to be recoverable. Such changes in circumstance may include (i) an expectation of a sale or disposal of a long-lived asset or asset group, (ii) adverse changes in market or competitive conditions, (iii) an adverse change in legal factors or business climate in the markets in which we operate and (iv) operating or cash flow losses. For purposes of impairment testing, long-lived assets are grouped at the lowest level for which cash flows are largely independent of other assets and liabilities, generally at or below the reporting unit level (see below). If the carrying amount of the asset or asset group is greater than the expected undiscounted cash flows to be generated by such asset or asset group, an impairment adjustment is recognized. Such adjustment is measured by the amount that the carrying value of such asset or asset group exceeds its fair value. We generally measure fair value by considering (a) sale prices for similar assets, (b) discounted estimated future cash flows using an appropriate discount rate and/or (c) estimated replacement cost. Assets to be disposed of are recorded at the lower of their carrying amount or fair value less costs to sell.

We evaluate goodwill and other indefinite-lived intangible assets for impairment at least annually on October 1 and whenever facts and circumstances indicate that their carrying amounts may not be recoverable. For impairment evaluations with respect to both goodwill and other indefinite-lived intangibles, we first make a qualitative assessment to determine if the goodwill or other indefinite-lived intangible may be impaired. In the case of goodwill, if it is more-likely-than-not that a reporting unit's fair value is less than its carrying value, we then compare the fair value of the reporting unit to its respective carrying amount. Any excess of the carrying amount over the fair value would be charged to operations as an impairment loss. A reporting unit is an operating segment or one level below an operating segment (referred to as a "component"). With respect to other indefinite-lived intangible assets, if it is more-likely-than-not that the fair value of an indefinite-lived intangible asset is less than its carrying value, we then estimate its fair value and any excess of the carrying value over the fair value is also charged to operations as an impairment loss.

When required, considerable management judgment is necessary to estimate the fair value of reporting units and underlying long-lived and indefinite-lived assets. The equity of one of our reporting units, Telenet, is publicly traded in an active market. For this reporting unit, our fair value determination is based on quoted market prices. For other reporting units, we typically determine fair value using an income-based approach (discounted cash flows) based on assumptions in our long-range business plans and, in some cases, a combination of an income-based approach and a market-based approach. With respect to our discounted cash flow analysis used in the income-based approach, the timing and amount of future cash flows under these business plans require estimates of, among other items, subscriber growth and retention rates, rates charged per product, expected gross margins and Adjusted OIBDA margins and expected property and equipment additions. The development of these cash flows, and the discount rate applied to the cash flows, is subject to inherent uncertainties, and actual results could vary significantly from such estimates. Our determination of the discount rate is based on a weighted average cost of capital approach, which uses a market participant's cost of equity and after-tax cost of debt and reflects the risks inherent in the cash flows. Based on the results of our 2019 qualitative assessment of our reporting unit carrying values, we determined that it was more-likely-than-not that fair value exceeded carrying value for all of our reporting units.

During the three years ended December 31, 2019, we did not record any significant impairment charges with respect to our property and equipment and intangible assets. For additional information regarding our long-lived assets, see note 10 to our consolidated financial statements.

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

Costs Associated with Construction and Installation Activities

We capitalize costs associated with the construction of new cable and mobile transmission and distribution facilities and the installation of new cable services. Installation activities that are capitalized include (i) the initial connection (or drop) from our cable system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as digital cable, telephone or broadband internet service. The costs of other customer-facing activities, such as reconnecting customer locations where a drop already exists, disconnecting customer locations and repairing or maintaining drops, are expensed as incurred.

The nature and amount of labor and other costs to be capitalized with respect to construction and installation activities involves significant judgment. In addition to direct external and internal labor and materials, we also capitalize other costs directly attributable to our construction and installation activities, including dispatch costs, quality-control costs, vehicle-related costs and certain warehouse-related costs. The capitalization of these costs is based on time sheets, time studies, standard costs, call tracking systems and other verifiable means that directly link the costs incurred with the applicable capitalizable activity. We continuously monitor the appropriateness of our capitalization policies and update the policies when necessary to respond to changes in facts and circumstances, such as the development of new products and services and changes in the manner that installations or construction activities are performed.

Fair Value Measurements

GAAP provides guidance with respect to the recurring and nonrecurring fair value measurements and for a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. Level 1 inputs are quoted market prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. Level 2 inputs are inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability.

Recurring Valuations. We perform recurring fair value measurements with respect to our derivative instruments, our fair value method investments and certain instruments that we classify as debt, each of which are carried at fair value. We use (i) cash flow valuation models to determine the fair values of our interest rate and foreign currency derivative instruments and (ii) a Black Scholes option pricing model to determine the fair values of our equity-related derivative instruments. We use quoted market prices when available and, when not available, we use a combination of an income approach (discounted cash flows) and a market approach (market multiples of similar businesses) to determine the fair value of our fair value method investments. For a detailed discussion of the inputs we use to determine the fair value of our derivative instruments and fair value method investments, see note 9 to our consolidated financial statements. See also notes 7 and 8 to our consolidated financial statements for information concerning our fair value method investments and derivative instruments, respectively.

Changes in the fair values of our derivative instruments, fair value method investments and certain instruments that we classify as debt have had, and we believe will continue to have, a significant and volatile impact on our results of operations. During 2019, 2018 and 2017, we recognized net gains (losses) of (\$120.0 million), \$741.3 million and (\$1,009.4 million), respectively, attributable to changes in the fair values of these items.

As further described in note 9 to our consolidated financial statements, actual amounts received or paid upon the settlement or disposition of these investments and instruments may differ materially from the recorded fair values at December 31, 2019.

For information concerning the sensitivity of the fair value of certain of our more significant derivative instruments to changes in market conditions, see *Quantitative and Qualitative Disclosures About Market Risk — Sensitivity Information* below.

Nonrecurring Valuations. Our nonrecurring valuations are primarily associated with (i) the application of acquisition accounting and (ii) impairment assessments, both of which require that we make fair value determinations as of the applicable valuation date. In making these determinations, we are required to make estimates and assumptions that affect the recorded amounts,

including, but not limited to, expected future cash flows, market comparables and discount rates, remaining useful lives of long-lived assets, replacement or reproduction costs of property and equipment and the amounts to be recovered in future periods from acquired net operating losses and other deferred tax assets. To assist us in making these fair value determinations, we may engage third-party valuation specialists. Our estimates in this area impact, among other items, the amount of depreciation and amortization, impairment charges and income tax expense or benefit that we report. Our estimates of fair value are based upon assumptions we believe to be reasonable, but which are inherently uncertain. A significant portion of our long-lived assets were initially recorded through the application of acquisition accounting and all of our long-lived assets are subject to impairment assessments. For additional information, see note 9 to our consolidated financial statements. For information regarding our acquisitions and long-lived assets, see notes 5 and 10 to our consolidated financial statements, respectively.

Income Tax Accounting

We are required to estimate the amount of tax payable or refundable for the current year and the deferred tax assets and liabilities for the future tax consequences attributable to differences between the financial statement carrying amounts and income tax basis of assets and liabilities and the expected benefits of utilizing net operating loss and tax credit carryforwards, using enacted tax rates in effect for each taxing jurisdiction in which we operate for the year in which those temporary differences are expected to be recovered or settled. This process requires our management to make assessments regarding the timing and probability of the ultimate tax impact of such items.

Net deferred tax assets are reduced by a valuation allowance if we believe it more-likely-than-not such net deferred tax assets will not be realized. Establishing or reducing a tax valuation allowance requires us to make assessments about the timing of future events, including the probability of expected future taxable income and available tax planning strategies. At December 31, 2019, the aggregate valuation allowance provided against deferred tax assets was \$4,235.5 million. The actual amount of deferred income tax benefits realized in future periods will likely differ from the net deferred tax assets reflected in our December 31, 2019 consolidated balance sheet due to, among other factors, possible future changes in income tax law or interpretations thereof in the jurisdictions in which we operate and differences between estimated and actual future taxable income. Any such factors could have a material effect on our current and deferred tax positions as reported in our consolidated financial statements. A high degree of judgment is required to assess the impact of possible future outcomes on our current and deferred tax positions.

Tax laws in jurisdictions in which we have a presence are subject to varied interpretation, and many tax positions we take are subject to significant uncertainty regarding whether the position will be ultimately sustained after review by the relevant tax authority. We recognize the financial statement effects of a tax position when it is more-likely-than-not, based on technical merits, that the position will be sustained upon examination. The determination of whether the tax position meets the more-likely-than-not threshold requires a facts-based judgment using all information available. In a number of cases, we have concluded that the more-likely-than-not threshold is not met and, accordingly, the amount of tax benefit recognized in our consolidated financial statements is different than the amount taken or expected to be taken in our tax returns. As of December 31, 2019, the amount of unrecognized tax benefits for financial reporting purposes, but taken or expected to be taken in our tax returns, was \$664.3 million, of which \$546.5 million would have a favorable impact on our effective income tax rate if ultimately recognized, after considering amounts that we would expect to be offset by valuation allowances.

We are required to continually assess our tax positions, and the results of tax examinations or changes in judgment can result in substantial changes to our unrecognized tax benefits.

Item 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

We are exposed to market risk in the normal course of our business operations due to our investments in various foreign countries and ongoing investing and financing activities. Market risk refers to the risk of loss arising from adverse changes in foreign currency exchange rates, interest rates and stock prices. The risk of loss can be assessed from the perspective of adverse changes in fair values, cash flows and future earnings. As further described below, we have established policies, procedures and processes governing our management of market risks and the use of derivative instruments to manage our exposure to such risks.

Cash and Investments

We invest our cash in highly liquid instruments that meet high credit quality standards. We are exposed to exchange rate risk to the extent that the denominations of our cash and cash equivalent balances, revolving lines of credit and other short-term sources of liquidity do not correspond to the denominations of our and our subsidiaries' short-term liquidity requirements. In order to mitigate this risk, we actively manage the denominations of our cash balances in light of our and our subsidiaries' forecasted liquidity requirements. At December 31, 2019, \$7,156.6 million or 87.9% and \$747.7 million or 9.2% of our consolidated cash balances were denominated in U.S. dollars and euros, respectively.

We are exposed to market price fluctuations related to our investments in ITV and Lionsgate shares. At December 31, 2019, the aggregate fair value of these investments was \$798.1 million and \$68.0 million, respectively. All of our ITV shares are held through the ITV Collar, and 25% of our Lionsgate shares are held through the Lionsgate Forward. For information concerning the terms of (i) the ITV Collar and ITV Collar Loan and (ii) the Lionsgate Forward and Lionsgate Loan, see note 8 to our consolidated financial statements. For those shares that are held through the ITV Collar and the Lionsgate Forward, our exposure to market risk is limited. For additional information concerning our investments in ITV and Lionsgate shares, see note 7 to our consolidated financial statements.

Foreign Currency Risk

We are exposed to foreign currency exchange rate risk with respect to our consolidated debt in situations where our debt is denominated in a currency other than the functional currency of the operations whose cash flows support our ability to repay or refinance such debt. Although we generally match the denomination of our and our subsidiaries' borrowings with the functional currency of the operations that are supporting the respective borrowings, market conditions or other factors may cause us to enter into borrowing arrangements that are not denominated in the functional currency of the underlying operations (unmatched debt). In these cases, our policy is to provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2019, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations. For additional information concerning the terms of our derivative instruments, see note 8 to our consolidated financial statements.

In addition to the exposure that results from the mismatch of our borrowings and underlying functional currencies, we are exposed to foreign currency risk to the extent that we enter into transactions denominated in currencies other than our or our subsidiaries' respective functional currencies (non-functional currency risk), such as equipment purchases, programming contracts, notes payable and notes receivable (including intercompany amounts). Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these items will result in unrealized (based upon period-end exchange rates) or realized foreign currency transaction gains and losses upon settlement of the transactions. Moreover, to the extent that our revenue, costs and expenses are denominated in currencies other than our respective functional currencies, we will experience fluctuations in our revenue, costs and expenses solely as a result of changes in foreign currency exchange rates. Generally, we will consider hedging non-functional currency risks when the risks arise from agreements with third parties that involve the future payment or receipt of cash or other monetary items to the extent that we can reasonably predict the timing and amount of such payments or receipts and the payments or receipts are not otherwise hedged. In this regard, we have entered into foreign currency forward contracts to hedge certain of these risks. For additional information concerning our foreign currency forward contracts, see note 8 to our consolidated financial statements.

We also are exposed to unfavorable and potentially volatile fluctuations of the U.S. dollar (our reporting currency) against the currencies of our operating subsidiaries when their respective financial statements are translated into U.S. dollars for inclusion in our consolidated financial statements. Cumulative translation adjustments are recorded in accumulated other comprehensive earnings or loss as a separate component of equity. Any increase (decrease) in the value of the U.S. dollar against any foreign currency that is the functional currency of one of our operating subsidiaries will cause us to experience unrealized foreign currency translation losses (gains) with respect to amounts already invested in such foreign currencies. Accordingly, we may experience a negative impact on our comprehensive earnings or loss and equity with respect to our holdings solely as a result of FX. Our primary exposure to FX risk during the three months ended December 31, 2019 was to the British pound sterling and euro as 53.0% and

32.8% of our reported revenue during the period was derived from subsidiaries whose functional currencies are the British pound sterling and euro, respectively. In addition, our reported operating results are impacted by changes in the exchange rates for the Swiss franc and other local currencies in Europe. We do not hedge against the risk that we may incur non-cash losses upon the translation of the financial statements of our subsidiaries and affiliates into U.S. dollars. For information regarding certain currency instability risks with respect to the British pound sterling and euro, see *Management's Discussion and Analysis of Financial Condition and Results of Operations — Overview* above.

The relationships between the primary currencies of the countries in which we operate and the U.S. dollar, which is our reporting currency, are shown below, per one U.S. dollar:

	As of December 31,	
	2019	2018
Spot rates:		
Euro	0.8906	0.8732
British pound sterling	0.7540	0.7846
Swiss franc	0.9664	0.9828
Polish zloty	3.7906	3.7454

	Year ended December 31,		
	2019	2018	2017
Average rates:			
Euro	0.8933	0.8472	0.8852
British pound sterling	0.7835	0.7498	0.7767
Swiss franc	0.9937	0.9781	0.9847
Polish zloty	3.8388	3.6108	3.7766

Inflation and Foreign Investment Risk

We are subject to inflationary pressures with respect to labor, programming and other costs. While we attempt to increase our revenue to offset increases in costs, there is no assurance that we will be able to do so. Therefore, costs could rise faster than associated revenue, thereby resulting in a negative impact on our operating results, cash flows and liquidity. The economic environment in the respective countries in which we operate is a function of government, economic, fiscal and monetary policies and various other factors beyond our control that could lead to inflation. We are unable to predict the extent that price levels might be impacted in future periods by the current state of the economies in the countries in which we operate.

Interest Rate Risks

We are exposed to changes in interest rates primarily as a result of our borrowing activities, which include fixed-rate and variable-rate borrowings by our borrowing groups. Our primary exposure to variable-rate debt is through the EURIBOR-indexed and LIBOR-indexed debt of our borrowing groups and the variable-rate debt of certain of our other subsidiaries.

In general, we enter into derivative instruments to protect against increases in the interest rates on our variable-rate debt. Accordingly, we have entered into various derivative transactions to manage exposure to increases in interest rates. We use interest rate derivative contracts to exchange, at specified intervals, the difference between fixed and variable interest rates calculated by reference to an agreed-upon notional principal amount. We also use (i) purchased interest rate cap and collar agreements and swaptions to lock in a maximum interest rate if variable rates rise, but also allow our company to benefit, to a limited extent in the case of collars, from declines in market rates, and (ii) purchased interest rate floor agreements to protect against interest rates falling below a certain level, generally to match a floating rate floor on a debt instrument. Under our current guidelines, we use various interest rate derivative instruments to mitigate interest rate risk, generally for five years, with the later years covered primarily by swaptions. As such, the final maturity dates of our various portfolios of interest rate derivative instruments generally fall short of the respective maturities of the underlying variable-rate debt. In this regard, we use judgment to determine the appropriate composition and maturity dates of our portfolios of interest rate derivative instruments, taking into account the relative costs and benefits of different maturity profiles in light of current and expected future market conditions, liquidity issues and other factors. For additional information concerning the impacts of these interest rate derivative instruments, see note 8 to our consolidated financial statements.

In July 2017, the U.K. Financial Conduct Authority (the authority that regulates LIBOR) announced that it intends to stop compelling banks to submit rates for the calculation of LIBOR after 2021. Additionally, the European Money Markets Institute (the authority that administers EURIBOR) has announced that measures will need to be undertaken by the end of 2021 to reform EURIBOR to ensure compliance with E.U. Benchmarks Regulation. Currently, it is not possible to predict the exact transitional arrangements for calculating applicable reference rates that may be made in the U.K., the U.S., the Eurozone or elsewhere given that a number of outcomes are possible, including the cessation of the publication of one or more reference rates. Our loan documents contain provisions that contemplate alternative calculations of the base rate applicable to our LIBOR-indexed and EURIBOR-indexed debt to the extent LIBOR or EURIBOR (as applicable) are not available, which alternative calculations we do not anticipate will be materially different from what would have been calculated under LIBOR or EURIBOR (as applicable). Additionally, no mandatory prepayment or redemption provisions would be triggered under our loan documents in the event that either the LIBOR rate or the EURIBOR rate is not available. It is possible, however, that any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed debt could be different than any new reference rate that applies to our LIBOR-indexed or EURIBOR-indexed derivative instruments. We anticipate managing this difference and any resulting increased variable-rate exposure through modifications to our debt and/or derivative instruments, however future market conditions may not allow immediate implementation of desired modifications and the company may incur significant associated costs.

Weighted Average Variable Interest Rate. At December 31, 2019, the outstanding principal amount of our variable-rate indebtedness aggregated \$11.7 billion, and the weighted average interest rate (including margin) on such variable-rate indebtedness was approximately 3.8%, excluding the effects of interest rate derivative contracts, deferred financing costs, original issue premiums or discounts and commitment fees, all of which affect our overall cost of borrowing. Assuming no change in the amount outstanding, and without giving effect to any interest rate derivative contracts, deferred financing costs, original issue premiums or discounts and commitment fees, a hypothetical 50 basis point (0.50%) increase (decrease) in our weighted average variable interest rate would increase (decrease) our annual consolidated interest expense and cash outflows by \$58.5 million. As discussed above and in note 8 to our consolidated financial statements, we use interest rate derivative contracts to manage our exposure to increases in variable interest rates. In this regard, increases in the fair value of these contracts generally would be expected to offset most of the economic impact of increases in the variable interest rates applicable to our indebtedness to the extent and during the period that principal amounts are matched with interest rate derivative contracts.

Counterparty Credit Risk

We are exposed to the risk that the counterparties to the derivative instruments, undrawn debt facilities and cash investments of our subsidiary borrowing groups will default on their obligations to us. We manage these credit risks through the evaluation and monitoring of the creditworthiness of, and concentration of risk with, the respective counterparties. In this regard, credit risk associated with our derivative instruments and undrawn debt facilities is spread across a relatively broad counterparty base of banks and financial institutions. With the exception of a limited number of instances where we have required a counterparty to post collateral, neither party has posted collateral under the derivative instruments of our subsidiary borrowing groups. Collateral is generally not posted by either party under the derivative instruments of our subsidiary borrowing groups. Most of our cash currently is invested in either (i) AAA credit rated money market funds, including funds that invest in government obligations, or (ii) overnight deposits with banks having a minimum credit rating of A by Standard & Poor's or an equivalent rating by Moody's Investor Service. To date, neither the access to nor the value of our cash and cash equivalent balances have been adversely impacted by liquidity problems of financial institutions.

At December 31, 2019, our exposure to counterparty credit risk included (i) derivative assets with an aggregate fair value of \$253.2 million, (ii) cash and cash equivalent and restricted cash balances of \$8,180.9 million and (iii) aggregate undrawn debt facilities of \$3,005.0 million.

Each of our subsidiary borrowing groups have entered into derivative instruments under master agreements with each counterparty that contain master netting arrangements that are applicable in the event of early termination by either party to such derivative instrument. The master netting arrangements are limited to the derivative instruments, and derivative-related debt instruments, governed by the relevant master agreement within each individual borrowing group and are independent of similar arrangements of our other subsidiary borrowing groups.

Under our derivative contracts, it is generally only the non-defaulting party that has a contractual option to exercise early termination rights upon the default of the other counterparty and to set off other liabilities against sums due upon such termination. However, in an insolvency of a derivative counterparty, under the laws of certain jurisdictions, the defaulting counterparty or its insolvency representatives may be able to compel the termination of one or more derivative contracts and trigger early termination payment liabilities payable by us, reflecting any mark-to-market value of the contracts for the counterparty. Alternatively, or in addition, the insolvency laws of certain jurisdictions may require the mandatory set off of amounts due under such derivative

contracts against present and future liabilities owed to us under other contracts between us and the relevant counterparty. Accordingly, it is possible that we may be subject to obligations to make payments, or may have present or future liabilities owed to us partially or fully discharged by set off as a result of such obligations, in the event of the insolvency of a derivative counterparty, even though it is the counterparty that is in default and not us. To the extent that we are required to make such payments, our ability to do so will depend on our liquidity and capital resources at the time. In an insolvency of a defaulting counterparty, we will be an unsecured creditor in respect of any amount owed to us by the defaulting counterparty, except to the extent of the value of any collateral we have obtained from that counterparty.

In addition, where a counterparty is in financial difficulty, under the laws of certain jurisdictions, the relevant regulators may be able to (i) compel the termination of one or more derivative instruments, determine the settlement amount and/or compel, without any payment, the partial or full discharge of liabilities arising from such early termination that are payable by the relevant counterparty or (ii) transfer the derivative instruments to an alternative counterparty.

While we currently have no specific concerns about the creditworthiness of any counterparty for which we have material credit risk exposures, we cannot rule out the possibility that one or more of our counterparties could fail or otherwise be unable to meet its obligations to us. Any such instance could have an adverse effect on our cash flows, results of operations, financial condition and/or liquidity.

Although we actively monitor the creditworthiness of our key vendors, the financial failure of a key vendor could disrupt our operations and have an adverse impact on our revenue and cash flows.

Sensitivity Information

Information concerning the sensitivity of the fair value of certain of our more significant derivative instruments to changes in market conditions is set forth below. The potential changes in fair value set forth below do not include any amounts associated with the remeasurement of the derivative asset or liability into the applicable functional currency. For additional information, see notes 8 and 9 to our consolidated financial statements.

Virgin Media Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2019, an instantaneous increase (decrease) of 10% in the value of the British pound sterling relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the Virgin Media cross-currency and interest rate derivative contracts by approximately £592 million (\$785 million).

UPC Holding Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2019:

- (i) an instantaneous increase (decrease) of 10% in the value of the Swiss franc and Polish zloty relative to the euro would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €380 million (\$427 million);
- (ii) an instantaneous increase (decrease) of 10% in the value of the Swiss franc relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €93 million (\$104 million); and
- (iii) an instantaneous increase (decrease) of 10% in the value of the euro relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the UPC Holding cross-currency and interest rate derivative contracts by approximately €78 million (\$88 million).

Telenet Cross-currency and Interest Rate Derivative Contracts

Holding all other factors constant, at December 31, 2019:

- (i) an instantaneous increase (decrease) of 10% in the value of the euro relative to the U.S. dollar would have decreased (increased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €356 million (\$400 million); and

- (ii) an instantaneous increase (decrease) in the relevant base rate of 50 basis points (0.50%) would have increased (decreased) the aggregate fair value of the Telenet cross-currency and interest rate derivative contracts by approximately €96 million (\$108 million).

ITV Collar

Holding all other factors constant, at December 31, 2019, an instantaneous increase (decrease) of 10% in the per share market price of ITV's ordinary shares would have decreased (increased) the fair value of the ITV Collar by approximately £60 million (\$80 million).

Projected Cash Flows Associated with Derivative Instruments

The following table provides information regarding the projected cash flows associated with our derivative instruments. The U.S. dollar equivalents presented below are based on interest rate projections and exchange rates as of December 31, 2019. These amounts are presented for illustrative purposes only and will likely differ from the actual cash payments or receipts required in future periods. For additional information regarding our derivative instruments, see note 8 to our consolidated financial statements. For information concerning the counterparty credit risk associated with our derivative instruments, see the discussion under *Counterparty Credit Risk* above.

	Payments (receipts) due during:						Total
	2020	2021	2022	2023	2024	Thereafter	
	in millions						
Projected derivative cash payments (receipts), net:							
Interest-related (a)	\$ 82.3	\$ (18.8)	\$ (15.5)	\$ (37.6)	\$ (54.5)	\$ —	\$ (44.1)
Principal-related (b)	46.0	(66.8)	(63.7)	24.4	(51.0)	(324.2)	(435.3)
Other (c)	—	(54.3)	(418.9)	(163.7)	—	—	(636.9)
Total	<u>\$ 128.3</u>	<u>\$ (139.9)</u>	<u>\$ (498.1)</u>	<u>\$ (176.9)</u>	<u>\$ (105.5)</u>	<u>\$ (324.2)</u>	<u>\$ (1,116.3)</u>

- (a) Includes (i) the cash flows of our interest rate cap, swaption, collar and swap contracts and (ii) the interest-related cash flows of our cross-currency and interest rate swap contracts.
- (b) Includes the principal-related cash flows of our cross-currency swap contracts.
- (c) Includes amounts related to our equity-related derivative instruments and foreign currency forward contracts. We may elect to use cash or the collective value of the related shares and equity-related derivative instrument to settle the ITV Collar Loan and the Lionsgate Loan.

Item 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements of Liberty Global are filed under this Item, beginning on pageII-44. Financial statement schedules are filed under Item 15 of this Annual Report on Form 10-K.

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

None.

Item 9A. CONTROLS AND PROCEDURES

Evaluation of disclosure controls and procedures

In accordance with Exchange Act Rule 13a-15, we carried out an evaluation, under the supervision and with the participation of management, including our chief executive officer and chief financial officer (the Executives), of the effectiveness of our disclosure controls and procedures as of December 31, 2019. In designing and evaluating the disclosure controls and procedures, the Executives recognize that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives, and management is necessarily required to apply judgment in evaluating the cost-benefit relationship of possible controls and objectives. Based on that evaluation, the Executives concluded that our disclosure controls and procedures are effective as of December 31, 2019, to provide reasonable assurance that information required to be disclosed in our reports filed or submitted under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms.

Internal control over financial reporting

(a) Management's Annual Report on Internal Control over Financial Reporting

Management's annual report on internal control over financial reporting is included herein on pageII-41.

(b) Attestation Report of the Independent Registered Public Accounting Firm

The attestation report of KPMG LLP is included herein on pageII-42.

(c) Changes in Internal Control over Financial Reporting

There have been no changes in our internal controls over financial reporting identified in connection with the evaluation described above that occurred during the fourth fiscal quarter covered by this Annual Report on Form 10-K that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. OTHER INFORMATION

Not applicable.

Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) of the Securities Exchange Act of 1934. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. 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.

Our management assessed the effectiveness of internal control over financial reporting as of December 31, 2019, using the criteria in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management believes that our internal control over financial reporting was effective as of December 31, 2019. The effectiveness of our internal control over financial reporting has been audited by KPMG LLP, an independent registered public accounting firm, as stated in their report included herein. In June 2019, we acquired the remaining 50% interest in De Vijver Media NV (**De Vijver Media**) that we did not previously own. Our evaluation of internal control over financial reporting did not include the internal control of De Vijver Media. The amount of total assets and revenue included in our consolidated financial statements as of and for the year ended December 31, 2019 that is attributable to De Vijver Media was \$254.5 million and \$81.1 million, respectively.

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Liberty Global plc:

Opinion on Internal Control Over Financial Reporting

We have audited Liberty Global plc and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive earnings (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes and financial statement schedules I and II (collectively, the consolidated financial statements), and our report dated February 13, 2020 expressed an unqualified opinion on those consolidated financial statements.

The Company acquired the remaining 50% interest in De Vijver Media NV (De Vijver Media) during 2019, and management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, De Vijver Media's internal control over financial reporting associated with total assets of \$254.5 million and total revenue of \$81.1 million included in the consolidated financial statements of the Company as of and for the year ended December 31, 2019. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of De Vijver Media.

Basis for Opinion

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

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control Over Financial Reporting

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

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

/s/ KPMG LLP

Denver, Colorado
February 13, 2020

Report of Independent Registered Public Accounting Firm

To the Shareholders and Board of Directors
Liberty Global plc:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Liberty Global plc and subsidiaries (the Company) as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive earnings (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes and financial statement schedules I and II (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated February 13, 2020 expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting.

Change in Accounting Principle

As discussed in Note 2 to the consolidated financial statements, the Company has changed its method of accounting for leases as of January 1, 2019 due to the adoption of Accounting Standards Update No. 2016-02, *Leases*. Also as discussed in Note 2, the Company changed its method of accounting for revenue from contracts with customers as of January 1, 2018 due to the adoption of Accounting Standards Update No. 2014-09, *Revenue from Contracts with Customers*.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the 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. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that: (1) relates to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially challenging, subjective, or complex judgment. The communication of a critical audit matter does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Assessment of capitalization of internal and external labor and overhead costs for construction and installation activities

As discussed in Notes 3 and 10 to the consolidated financial statements, the Company capitalizes certain internal and external labor and overhead costs. Capitalized internal and external labor and overhead costs are recorded within property and equipment, which has a net balance of \$13,843.4 million as of December 31, 2019.

We identified the assessment of the capitalization of internal and external labor and overhead costs for construction and installation activities as a critical audit matter. Assessing the Company's determination of which costs qualify for capitalization or expense in the period involved subjective auditor judgment.

The primary procedures we performed to address this critical audit matter included the following. We tested certain internal controls over the Company's processes to assess (1) the Company's identification of qualifying capital costs and (2) the Company's review of the nature of the underlying activity. We selected a sample of capitalized internal and external labor and overhead costs and assessed the capitalization by investigating the nature of the costs based on underlying internal and third-party documentation. We interviewed operational personnel at the Company to assess the relevance and reliability of the internal documentation provided to support the determination of capitalization versus expense treatment for construction and installation activities. We compared the internal and external labor and overhead costs capitalized in the current year for construction and installation activities to the historical internal and external labor and overhead costs capitalized, considering the nature of the Company's business activities, to identify, for further investigation, inconsistent trends or unexpected patterns of capitalization.

/s/ KPMG LLP

We have served as the Company's auditor since 2004.

Denver, Colorado
February 13, 2020

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS

	December 31,	
	2019	2018
	in millions	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 8,142.4	\$ 1,480.5
Trade receivables, net	1,404.8	1,342.1
Derivative instruments (note 8)	331.1	394.2
Current assets of discontinued operations (note 6)	—	356.5
Other current assets (notes 4, 6 and 7)	695.0	568.1
Total current assets	10,573.3	4,141.4
Investments and related notes receivable (including \$1,289.2 million and \$1,174.8 million, respectively, measured at fair value on a recurring basis) (note 7)	4,782.0	5,121.8
Property and equipment, net (notes 10 and 12)	13,843.4	13,878.9
Goodwill (note 10)	14,052.1	13,715.8
Deferred tax assets (note 13)	2,457.4	2,488.2
Long-term assets of discontinued operations (note 6)	—	10,174.6
Other assets, net (notes 4, 6, 8, 10 and 12)	3,338.1	3,632.9
Total assets	\$ 49,046.3	\$ 53,153.6

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

LIBERTY GLOBAL PLC
CONSOLIDATED BALANCE SHEETS — (Continued)

	December 31,	
	2019	2018
	in millions	
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	\$ 963.9	\$ 874.3
Deferred revenue	834.9	847.1
Current portion of debt and finance lease obligations (notes 11 and 12)	3,877.2	3,615.2
Accrued capital expenditures	405.2	543.2
Current liabilities of discontinued operations (note 6)	—	1,967.5
Other accrued and current liabilities (notes 8, 12 and 16)	2,570.5	2,458.8
Total current liabilities	8,651.7	10,306.1
Long-term debt and finance lease obligations (notes 11 and 12)	24,305.3	26,190.0
Long-term liabilities of discontinued operations (note 6)	—	10,072.4
Other long-term liabilities (notes 8, 12, 13, 16 and 17)	2,890.7	2,436.8
Total liabilities	35,847.7	49,005.3
Commitments and contingencies (notes 8, 11, 13, 17 and 19)		
Equity (note 14):		
Liberty Global shareholders:		
Liberty Global Shares — Class A, \$0.01 nominal value. Issued and outstanding 181,560,735 and 204,450,499 shares, respectively	1.8	2.0
Liberty Global Shares — Class B, \$0.01 nominal value. Issued and outstanding 12,151,526 and 11,099,593 shares, respectively	0.1	0.1
Liberty Global Shares — Class C, \$0.01 nominal value. Issued and outstanding 438,867,447 and 531,174,389 shares, respectively	4.4	5.3
Additional paid-in capital	6,136.9	9,214.5
Accumulated earnings (deficit)	6,350.4	(5,172.2)
Accumulated other comprehensive earnings, net of taxes	1,112.7	631.8
Treasury shares, at cost	(0.1)	(0.1)
Total Liberty Global shareholders	13,606.2	4,681.4
Noncontrolling interests	(407.6)	(533.1)
Total equity	13,198.6	4,148.3
Total liabilities and equity	\$ 49,046.3	\$ 53,153.6

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF OPERATIONS

	Year ended December 31,		
	2019	2018	2017
in millions, except share and per share amounts			
Revenue (notes 4, 6, 7 and 20)	\$ 11,541.5	\$ 11,957.9	\$ 11,276.4
Operating costs and expenses (exclusive of depreciation and amortization, shown separately below):			
Programming and other direct costs of services	3,238.7	3,246.1	2,973.6
Other operating (note 15)	1,641.3	1,717.2	1,659.5
Selling, general and administrative (SG&A) (note 15)	2,107.8	2,049.1	1,980.4
Depreciation and amortization (note 10)	3,652.2	3,858.2	3,790.6
Impairment, restructuring and other operating items, net (notes 5, 16 and 17)	156.0	248.2	79.9
	<u>10,796.0</u>	<u>11,118.8</u>	<u>10,484.0</u>
Operating income	<u>745.5</u>	<u>839.1</u>	<u>792.4</u>
Non-operating income (expense):			
Interest expense	(1,385.9)	(1,478.7)	(1,416.1)
Realized and unrealized gains (losses) on derivative instruments, net (note 8)	(192.0)	1,125.8	(1,052.8)
Foreign currency transaction gains (bsses), net	(94.8)	90.4	(181.5)
Realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net (notes 7, 9 and 11)	72.0	(384.5)	43.4
Losses on debt modification and extinguishment, net (note 11)	(216.7)	(65.0)	(252.2)
Share of results of affiliates, net (note 7)	(198.5)	(8.7)	(95.2)
Other income, net	114.4	43.4	50.9
	<u>(1,901.5)</u>	<u>(677.3)</u>	<u>(2,903.5)</u>
Earnings (loss) from continuing operations before income taxes	<u>(1,156.0)</u>	<u>161.8</u>	<u>(2,111.1)</u>
Income tax expense (note 13)	<u>(253.0)</u>	<u>(1,573.3)</u>	<u>(238.9)</u>
Loss from continuing operations	<u>(1,409.0)</u>	<u>(1,411.5)</u>	<u>(2,350.0)</u>
Discontinued operations (note 6):			
Earnings (loss) from discontinued operations, net of taxes	730.3	1,163.4	(370.6)
Gain on disposal of discontinued operations, net of taxes	12,316.9	1,098.1	—
	<u>13,047.2</u>	<u>2,261.5</u>	<u>(370.6)</u>
Net earnings (loss)	<u>11,638.2</u>	<u>850.0</u>	<u>(2,720.6)</u>
Net earnings attributable to noncontrolling interests	<u>(116.8)</u>	<u>(124.7)</u>	<u>(57.5)</u>
Net earnings (loss) attributable to Liberty Global shareholders	<u>\$ 11,521.4</u>	<u>\$ 725.3</u>	<u>\$ (2,778.1)</u>
Basic and diluted loss from continuing operations attributable to Liberty Global shareholders per share (note 3)			
	<u>\$ (2.16)</u>	<u>\$ (1.97)</u>	<u>\$ (2.86)</u>
Weighted average shares outstanding - basic and diluted	<u>705,794,546</u>	<u>778,675,957</u>	<u>847,894,601</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF COMPREHENSIVE EARNINGS (LOSS)

	Year ended December 31,		
	2019	2018	2017
	in millions		
Net earnings (loss)	\$ 11,638.2	\$ 850.0	\$ (2,720.6)
Other comprehensive earnings (loss), net of taxes (note 18):			
Continuing operations:			
Foreign currency translation adjustments	435.5	(897.9)	1,898.7
Pension-related adjustments and other	(14.4)	(20.0)	15.7
Other comprehensive earnings (loss) from continuing operations	421.1	(917.9)	1,914.4
Other comprehensive earnings (loss) from discontinued operations (note 6)	61.0	(106.1)	30.4
Other comprehensive earnings (loss)	482.1	(1,024.0)	1,944.8
Comprehensive earnings (loss)	12,120.3	(174.0)	(775.8)
Comprehensive earnings attributable to noncontrolling interests	(118.0)	(124.9)	(59.2)
Comprehensive earnings (loss) attributable to Liberty Global shareholders	<u>\$ 12,002.3</u>	<u>\$ (298.9)</u>	<u>\$ (835.0)</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY

	Liberty Global shareholders								
	Liberty Global Shares	LiLAC Shares	Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive earnings (loss), net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	in millions								
Balance at January 1, 2017, before effect of accounting change	\$ 8.9	\$ 1.7	\$17,578.2	\$ (3,454.8)	\$ (372.4)	\$ (0.3)	\$ 13,761.3	\$ 970.7	\$14,732.0
Accounting change (note 2)	—	—	—	15.3	—	—	15.3	—	15.3
Balance at January 1, 2017, as adjusted for accounting change	8.9	1.7	17,578.2	(3,439.5)	(372.4)	(0.3)	13,776.6	970.7	14,747.3
Net loss	—	—	—	(2,778.1)	—	—	(2,778.1)	57.5	(2,720.6)
Other comprehensive earnings, net of taxes (note 18)	—	—	—	—	1,943.1	—	1,943.1	1.7	1,944.8
Impact of the Split-off Transaction (note 6)	—	(1.7)	(3,346.8)	—	85.3	—	(3,263.2)	(1,360.9)	(4,624.1)
Repurchase and cancellation of Liberty Global ordinary shares (note 14)	(0.8)	—	(2,947.4)	—	—	—	(2,948.2)	—	(2,948.2)
Share-based compensation (note 15)	—	—	155.9	—	—	—	155.9	—	155.9
Adjustments due to changes in subsidiaries' equity and other, net	—	—	(81.3)	—	—	0.2	(81.1)	(81.0)	(162.1)
Balance at December 31, 2017	<u>\$ 8.1</u>	<u>\$ —</u>	<u>\$11,358.6</u>	<u>\$ (6,217.6)</u>	<u>\$ 1,656.0</u>	<u>\$ (0.1)</u>	<u>\$ 6,805.0</u>	<u>\$ (412.0)</u>	<u>\$ 6,393.0</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

	Liberty Global shareholders									
	Ordinary shares			Additional paid-in capital	Accumulated deficit	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	Class A	Class B	Class C							
	in millions									
Balance at January 1, 2018, before effect of accounting change	\$ 2.2	\$ 0.1	\$ 5.8	\$ 11,358.6	\$ (6,217.6)	\$ 1,656.0	\$ (0.1)	\$ 6,805.0	\$ (412.0)	\$ 6,393.0
Accounting change (note 2)	—	—	—	—	320.1	—	—	320.1	4.4	324.5
Balance at January 1, 2018, as adjusted for accounting change	2.2	0.1	5.8	11,358.6	(5,897.5)	1,656.0	(0.1)	7,125.1	(407.6)	6,717.5
Net earnings	—	—	—	—	725.3	—	—	725.3	124.7	850.0
Other comprehensive loss, net of taxes (note 18)	—	—	—	—	—	(1,024.2)	—	(1,024.2)	0.2	(1,024.0)
Repurchase and cancellation of Liberty Global ordinary shares (note 13)	(0.2)	—	(0.5)	(2,009.3)	—	—	—	(2,010.0)	—	(2,010.0)
Distributions by subsidiaries to noncontrolling interest owners (note 14)	—	—	—	—	—	—	—	—	(298.4)	(298.4)
Repurchases by Telenet of its outstanding shares	—	—	—	(294.0)	—	—	—	(294.0)	35.4	(258.6)
Share-based compensation (note 15)	—	—	—	154.4	—	—	—	154.4	—	154.4
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	4.8	—	—	—	4.8	12.6	17.4
Balance at December 31, 2018	<u>\$ 2.0</u>	<u>\$ 0.1</u>	<u>\$ 5.3</u>	<u>\$ 9,214.5</u>	<u>\$ (5,172.2)</u>	<u>\$ 631.8</u>	<u>\$ (0.1)</u>	<u>\$ 4,681.4</u>	<u>\$ (533.1)</u>	<u>\$ 4,148.3</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF EQUITY — (Continued)

	Liberty Global shareholders									
	Ordinary shares			Additional paid-in capital	Accumulated earnings (deficit)	Accumulated other comprehensive earnings, net of taxes	Treasury shares, at cost	Total Liberty Global shareholders	Non- controlling interests	Total equity
	Class A	Class B	Class C							
	in millions									
Balance at January 1, 2019, before effect of accounting change	\$ 2.0	\$ 0.1	\$ 5.3	\$ 9,214.5	\$ (5,172.2)	\$ 631.8	\$ (0.1)	\$ 4,681.4	\$ (533.1)	\$ 4,148.3
Accounting change (note 2)	—	—	—	—	1.2	—	—	1.2	—	1.2
Balance at January 1, 2019, as adjusted for accounting change	2.0	0.1	5.3	9,214.5	(5,171.0)	631.8	(0.1)	4,682.6	(533.1)	4,149.5
Net earnings	—	—	—	—	11,521.4	—	—	11,521.4	116.8	11,638.2
Other comprehensive earnings, net of taxes (note 18)	—	—	—	—	—	480.9	—	480.9	1.2	482.1
Repurchase and cancellation of Liberty Global ordinary shares (note 14)	(0.2)	—	(0.9)	(3,219.1)	—	—	—	(3,220.2)	—	(3,220.2)
Share-based compensation (note 15)	—	—	—	250.1	—	—	—	250.1	—	250.1
Repurchases by Telenet of its outstanding shares	—	—	—	(134.5)	—	—	—	(134.5)	20.4	(114.1)
Adjustments due to changes in subsidiaries' equity and other, net	—	—	—	25.9	—	—	—	25.9	(12.9)	13.0
Balance at December 31, 2019	<u>\$ 1.8</u>	<u>\$ 0.1</u>	<u>\$ 4.4</u>	<u>\$ 6,136.9</u>	<u>\$ 6,350.4</u>	<u>\$ 1,112.7</u>	<u>\$ (0.1)</u>	<u>\$ 13,606.2</u>	<u>\$ (407.6)</u>	<u>\$ 13,198.6</u>

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year ended December 31,		
	2019	2018	2017
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 11,638.2	\$ 850.0	\$ (2,720.6)
Earnings (loss) from discontinued operations	13,047.2	2,261.5	(370.6)
Loss from continuing operations	(1,409.0)	(1,411.5)	(2,350.0)
Adjustments to reconcile loss from continuing operations to net cash provided by operating activities from continuing operations:			
Share-based compensation expense	305.8	206.0	162.2
Depreciation and amortization	3,652.2	3,858.2	3,790.6
Impairment, restructuring and other operating items, net	156.0	248.2	79.9
Amortization of deferred financing costs and non-cash interest	53.7	56.4	61.2
Realized and unrealized losses (gains) on derivative instruments, net	192.0	(1,125.8)	1,052.8
Foreign currency transaction losses (gains), net	94.8	(90.4)	181.5
Realized and unrealized losses (gains) due to changes in fair values of certain investments and debt, net	(72.0)	384.5	(43.4)
Losses on debt modification and extinguishment, net	216.7	65.0	252.2
Share of results of affiliates, net	198.5	8.7	95.2
Deferred income tax expense	65.5	438.1	46.6
Changes in operating assets and liabilities, net of the effects of acquisitions and dispositions:			
Receivables and other operating assets	876.9	635.4	466.1
Payables and accruals	(787.2)	459.4	(651.7)
Dividends from affiliates and others	170.2	252.8	299.5
Net cash provided by operating activities of continuing operations	3,714.1	3,985.0	3,442.7
Net cash provided by operating activities of discontinued operations	871.3	1,978.1	2,265.3
Net cash provided by operating activities	4,585.4	5,963.1	5,708.0
Cash flows from investing activities:			
Proceeds received upon disposition of discontinued operations, net	11,203.1	2,058.2	—
Capital expenditures, net	(1,243.1)	(1,453.0)	(1,250.0)
Funding of the Vodafone Escrow Accounts, net	(295.2)	—	—
Investments in and loans to affiliates and others	(256.1)	(88.8)	(118.3)
Cash paid in connection with acquisitions, net of cash acquired	(23.1)	(82.5)	(413.9)
Distributions received from affiliates	—	—	1,569.4
Equalization payment related to the VodafoneZiggo JV Transaction	—	—	845.3
Other investing activities, net	155.4	167.6	148.5
Net cash provided by investing activities of continuing operations	9,541.0	601.5	781.0
Net cash used by investing activities of discontinued operations	(266.4)	(514.2)	(1,341.8)
Net cash provided (used) by investing activities	\$ 9,274.6	\$ 87.3	\$ (560.8)

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

LIBERTY GLOBAL PLC
CONSOLIDATED STATEMENTS OF CASH FLOWS — (Continued)

	Year ended December 31,		
	2019	2018	2017
	in millions		
Cash flows from financing activities:			
Repayments and repurchases of debt and finance lease obligations	\$ (10,300.7)	\$ (8,170.6)	\$ (8,177.5)
Borrowings of debt	6,618.8	4,396.5	7,215.4
Repurchase of Liberty Global ordinary shares	(3,219.4)	(2,009.9)	(2,976.2)
Net cash received (paid) related to derivative instruments	331.5	112.8	(138.1)
Payment of financing costs and debt premiums	(206.8)	(73.1)	(249.6)
Repurchase by Telenet of its outstanding shares	(114.1)	(244.7)	(36.5)
Distributions by subsidiaries to noncontrolling interest owners	(32.6)	(290.3)	(13.0)
Value-added taxes (VAT) paid on behalf of the VodafoneZiggo JV	—	—	(162.6)
Other financing activities, net	1.0	(7.3)	33.9
Net cash used by financing activities of continuing operations	(6,922.3)	(6,286.6)	(4,504.2)
Net cash provided (used) by financing activities of discontinued operations	(254.3)	96.8	(175.4)
Net cash used by financing activities	(7,176.6)	(6,189.8)	(4,679.6)
Effect of exchange rate changes on cash and cash equivalents and restricted cash:			
Continuing operations	0.4	(43.2)	114.2
Discontinued operations	(1.2)	(1.9)	1.1
Total	(0.8)	(45.1)	115.3
Net increase (decrease) in cash and cash equivalents and restricted cash:			
Continuing operations	6,333.2	(1,743.3)	(166.3)
Discontinued operations - Vodafone Disposal Group, UPC Austria and UPC DTH	349.4	1,558.8	761.7
Discontinued operations - LiLAC Group	—	—	(12.5)
Total	\$ 6,682.6	\$ (184.5)	\$ 582.9
Cash and cash equivalents and restricted cash:			
Beginning of year	\$ 1,498.3	\$ 1,682.8	\$ 1,087.4
Net increase (decrease) (excluding, during 2017, LiLAC Group activity related to cash balances included in discontinued operations)	6,682.6	(184.5)	595.4
End of year	\$ 8,180.9	\$ 1,498.3	\$ 1,682.8
Cash paid for interest:			
Continuing operations	\$ 1,422.7	\$ 1,405.7	\$ 1,380.6
Discontinued operations	361.5	436.4	905.8
Total	\$ 1,784.2	\$ 1,842.1	\$ 2,286.4
Net cash paid for taxes:			
Continuing operations	\$ 358.2	\$ 309.0	\$ 269.7
Discontinued operations	135.9	55.1	143.4
Total	\$ 494.1	\$ 364.1	\$ 413.1
Details of end of period cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 8,142.4	\$ 1,480.5	\$ 1,672.4
Restricted cash included in other current assets and other assets, net	38.5	15.9	8.3
Restricted cash included in current and long-term assets of discontinued operations	—	1.9	2.1
Total cash and cash equivalents and restricted cash	\$ 8,180.9	\$ 1,498.3	\$ 1,682.8

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

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements
December 31, 2019, 2018 and 2017

(1) Basis of Presentation

Liberty Global plc (**Liberty Global**) is a public limited company organized under the laws of England and Wales. In these notes, the terms “we,” “our,” “our company” and “us” may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries. We are an international provider of broadband internet, video, fixed-line telephony and mobile communications services to residential customers and businesses in Europe.

Our continuing operations comprise businesses that provide residential and business-to-business (**B2B**) communications services in (i) the United Kingdom (**U.K.**) and Ireland through Virgin Media Inc. (**Virgin Media**), a wholly-owned subsidiary of Liberty Global, (ii) Belgium through Telenet Group Holding N.V. (**Telenet**), a 60.2%-owned subsidiary of Liberty Global and (iii) Switzerland, Poland and Slovakia through various wholly-owned subsidiaries that we collectively refer to as “**UPC Holding**.” In addition, we own a 50% noncontrolling interest in a 50:50 joint venture between Vodafone Group plc (**Vodafone**) and Liberty Global (the **VodafoneZiggo JV**), which provides residential and B2B communication services in the Netherlands.

Through July 31, 2019, we provided residential and B2B communication services in (i) Germany through Unitymedia GmbH (**Unitymedia**) and (ii) Hungary, the Czech Republic and Romania through UPC Holding B.V. In addition, (a) through May 2, 2019, we provided direct-to-home satellite (**DTH**) services to residential customers in Hungary, the Czech Republic, Romania and Slovakia through a Luxembourg-based subsidiary of UPC Holding B.V. that we refer to as “**UPC DTH**” and (b) through July 31, 2018, we provided residential and B2B communication services in Austria. In these consolidated financial statements, our operations in Austria, Germany, Romania, Hungary and the Czech Republic and the operations of UPC DTH are presented as discontinued operations for all applicable periods. For additional information regarding these dispositions, see note 6.

Prior to the December 29, 2017 completion of the Split-off Transaction (as defined and described in note 6), we also provided residential and B2B communication services in (i) various countries in Latin America and the Caribbean, through Cable & Wireless Communications Limited (**C&W**), (ii) Chile through VTR.com SpA (**VTR**) and (iii) Puerto Rico through Liberty Cablevision of Puerto Rico LLC (**Liberty Puerto Rico**). C&W and VTR were each wholly-owned subsidiaries of Liberty Global, and Liberty Puerto Rico was an entity in which we held a 60.0% ownership interest. C&W also provided (a) B2B services in certain other countries in Latin America and the Caribbean and (b) wholesale services over its sub-sea and terrestrial networks. The operations of C&W, VTR, Liberty Puerto Rico and certain other entities that were associated with our businesses in Latin America and the Caribbean are collectively referred to herein as the “**LiLAC Group**.” As a result of the Split-off Transaction, the entities attributed to the LiLAC Group are presented as discontinued operations in our consolidated statements of operations and cash flows for 2017.

Unless otherwise indicated, the amounts presented in these notes relate only to our continuing operations, and ownership percentages and convenience translations into United States (**U.S.**) dollars are calculated as of December 31, 2019.

(2) Accounting Changes and Recent Accounting Pronouncements

Accounting Changes

ASU 2016-02

In February 2016, the Financial Accounting Standards Board (**FASB**) issued Accounting Standards Update (**ASU**) No. 2016-02, *Leases* (**ASU 2016-02**), which, for most leases, results in lessees recognizing right-of-use (**ROU**) assets and lease liabilities on the balance sheet. ASU 2016-02, as amended by ASU No. 2018-11, *Targeted Improvements*, requires lessees and lessors to recognize and measure leases at the beginning of the earliest period presented using one of two modified retrospective approaches. A number of optional practical expedients may be applied in transition. We adopted ASU 2016-02 on January 1, 2019.

The main impact of the adoption of ASU 2016-02 relates to the recognition of ROU assets and lease liabilities on our consolidated balance sheet for those leases classified as operating leases under previous accounting principles generally accepted in the U.S. (**GAAP**). In transition, we have applied the practical expedients that permit us not to reassess (i) whether expired or existing contracts contain a lease under the new standard, (ii) the lease classification for expired or existing leases or (iii) whether previously-capitalized initial direct costs would qualify for capitalization under the new standard. In addition, we have not used hindsight during transition.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2019, 2018 and 2017

Upon adoption of ASU 2016-02, on January 1, 2019 our continuing operations recorded (i) ROU assets of \$545.1 million and lease liabilities of \$558.1 million related to operating leases, (ii) ROU assets and lease liabilities related to finance leases of \$26.2 million and (iii) a decrease to our accumulated deficit of \$1.2 million. In addition, we reclassified our existing prepaid lease expense, accrued lease expense and lease incentive liabilities, resulting in a net reduction of our ROU assets of \$14.2 million. The adoption of ASU 2016-02 did not have a significant impact on our consolidated statements of operations or cash flows.

We have implemented a new lease accounting system and related internal controls over financial reporting to meet the requirements of ASU 2016-02.

For additional information regarding our leases, see note 12.

ASU 2014-09

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (ASU 2014-09)*, which requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of goods or services to customers. We adopted ASU 2014-09 effective January 1, 2018 by recording the cumulative effect of the adoption to our accumulated deficit. We applied the new standard to contracts that were not complete at January 1, 2018. The comparative information for the year ended December 31, 2017 contained within these consolidated financial statements and notes has not been restated and continues to be reported under the accounting standards in effect for such period. The implementation of ASU 2014-09 did not have a material impact on our consolidated financial statements.

The principal impacts of ASU 2014-09 on our revenue recognition policies relate to our accounting for (i) time-limited discounts and free service periods provided to our customers and (ii) certain upfront fees charged to our customers, as follows:

- When we enter into contracts to provide services to our customers, we often provide time-limited discounts or free service periods. Under previous accounting rules, we recognized revenue, net of discounts, during the promotional periods and did not recognize any revenue during free service periods. Under ASU 2014-09, revenue recognition for those contracts that contain substantive termination penalties is recognized uniformly over the contractual period. For contracts that do not have substantive termination penalties, we continue to record the impacts of partial or full discounts during the applicable promotional periods.
- When we enter into contracts to provide services to our customers, we often charge installation or other upfront fees. Under previous accounting rules, installation fees related to services provided over our cable networks were recognized as revenue during the period in which the installation occurred to the extent these fees were equal to or less than direct selling costs. Under ASU 2014-09, these fees are generally deferred and recognized as revenue over the contractual period, or longer if the upfront fee results in a material renewal right.

ASU 2014-09 also impacted our accounting for certain upfront costs directly associated with obtaining and fulfilling customer contracts. Under our previous policy, these costs were expensed as incurred unless the costs were in the scope of another accounting topic that allowed for capitalization. Under ASU 2014-09, certain upfront costs associated with contracts that have substantive termination penalties and a term of one year or more are recognized as assets and amortized to operating costs and expenses over the applicable period benefited.

For additional information regarding the impact of our adoption of ASU 2014-09, see note 4.

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The cumulative effect of the adoption of ASU 2014-09 on our summary balance sheet information as of January 1, 2018 is as follows:

	Balance at December 31, 2017	ASU 2014-09 Adjustments	Balance at January 1, 2018
in millions			
Assets:			
Trade receivables, net	\$ 1,404.5	(0.7)	\$ 1,403.8
Current assets of discontinued operations	\$ 276.0	98.2	\$ 374.2
Other current assets	\$ 351.2	76.6	\$ 427.8
Investments and related note receivables (a)	\$ 6,671.4	191.2	\$ 6,862.6
Deferred tax assets	\$ 3,133.1	(16.0)	\$ 3,117.1
Long-term assets of discontinued operations	\$ 11,237.4	29.1	\$ 11,266.5
Other assets, net	\$ 3,720.2	21.4	\$ 3,741.6
Liabilities:			
Deferred revenue	\$ 936.6	5.6	\$ 942.2
Current liabilities of discontinued operations	\$ 1,635.9	26.7	\$ 1,662.6
Other accrued and current liabilities	\$ 2,219.0	1.2	\$ 2,220.2
Long-term liabilities of discontinued operations	\$ 10,014.4	39.1	\$ 10,053.5
Other long-term liabilities	\$ 2,246.6	2.7	\$ 2,249.3
Equity:			
Accumulated deficit (a)	\$ (6,217.6)	320.1	\$ (5,897.5)
Noncontrolling interests	\$ (412.0)	4.4	\$ (407.6)

- (a) The ASU 2014-09 adjustment amounts include the impact of our share of the VodafoneZiggo JV's adjustment to its owners' equity.

The impact of our adoption of ASU 2014-09 on our consolidated balance sheet as of December 31, 2019 was not materially different from the impacts set forth in the above January 1, 2018 summary balance sheet information. Similarly, the adoption of ASU 2014-09 did not have a material impact on our consolidated statement of operations for the year ended December 31, 2019.

ASU 2016-09

In March 2016, the FASB issued ASU No. 2016-09, *Compensation — Stock Compensation, Improvements to Employee Share-Based Payment Accounting (ASU 2016-09)*, which simplifies several aspects of the accounting for share-based payment transactions, including income tax consequences, classification of awards as either equity or liabilities and classification within the statement of cash flows. We adopted ASU 2016-09 on January 1, 2017. As a result of adopting this standard, we (i) recognized a cumulative effect adjustment to our accumulated deficit as of January 1, 2017 and (ii) retrospectively revised the presentation of our consolidated statements of cash flows to remove the operating cash outflows and financing cash inflows associated with excess tax benefits from share-based compensation. The cumulative effect adjustment, which totaled \$15.3 million, represents the tax effect of deductions in excess of the financial reporting expense for share-based compensation that were not previously recognized for financial reporting purposes as these tax benefits were not realized as a reduction of income taxes payable.

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Recent Accounting Pronouncements

ASU 2018-15

In August 2018, the FASB issued ASU No. 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement that is a Service Contract (ASU 2018-15)*, which requires entities to defer implementation costs incurred that are related to the application development stage in a cloud computing arrangement that is a service contract. Deferred implementation costs will be amortized over the term of the cloud computing arrangement and presented in the same expense line item as the cloud computing arrangement. All other implementation costs will generally be expensed as incurred. We adopted ASU 2018-15 on January 1, 2020 on a prospective basis. As a result of the adoption of ASU 2018-15, (i) certain implementation costs that were previously expensed as incurred will now be deferred as prepaid expenses and amortized over the term of the cloud computing arrangement and (ii) certain costs associated with developing interfaces between a cloud computing arrangement and internal-use software that were previously capitalized as property and equipment will now be deferred as prepaid expenses and amortized over the term of the cloud computing arrangement. We currently do not believe the adoption of ASU 2018-15 will have a significant impact on our consolidated financial statements.

ASU 2019-02

In March 2019, the FASB issued ASU No. 2019-02, *Improvements to Accounting for Costs of Films and License Agreements for Program Materials (ASU 2019-02)*, which aligns the accounting for production costs of an episodic television series with the accounting for production costs of films. ASU 2019-02 removes the existing constraint that restricts capitalization of production costs to contracted revenue for episodic television series. The amended guidance also permits entities to test a film or license agreement for impairment at the film group level, addresses cash flow classification and provides new disclosure requirements. We adopted ASU 2019-02 on January 1, 2020 on a prospective basis. The adoption of ASU 2019-02 did not have a significant impact on our consolidated financial statements.

ASU 2016-13

In June 2016, the FASB issued ASU No. 2016-13, *Measurement of Credit Losses on Financial Statements (ASU 2016-13)*, which changes the recognition model for credit losses related to assets held at amortized cost. ASU 2016-13 eliminates the threshold that a loss must be considered probable to recognize a credit loss and instead requires an entity to reflect its current estimate of lifetime expected credit losses. We adopted ASU 2016-13 on January 1, 2020 on a modified retrospective basis by recording a cumulative effect adjustment to our accumulated earnings. The adoption of ASU 2016-13 did not have a significant impact on our consolidated financial statements.

ASU 2019-12

In December 2019, the FASB issued ASU No. 2019-12, *Simplifying the Accounting for Income Taxes (ASU 2019-12)*, which is intended to improve consistency and simplify several areas of existing guidance. ASU 2019-12 removes certain exceptions to the general principles related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period and the recognition of deferred tax liabilities for outside basis differences. The new guidance also clarifies the accounting for transactions that result in a step-up in the tax basis of goodwill. ASU 2019-12 is effective for annual reporting periods beginning after December 15, 2020, including interim periods within those fiscal years, with early adoption permitted. We are currently evaluating the effect that ASU 2019-12 will have on our consolidated financial statements.

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(3) Summary of Significant Accounting Policies

Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenue and expenses during the reporting period. Estimates and assumptions are used in accounting for, among other things, the valuation of acquisition-related assets and liabilities, allowances for uncollectible accounts, certain components of revenue, programming and copyright costs, deferred income taxes and related valuation allowances, loss contingencies, fair value measurements, impairment assessments, capitalization of internal costs associated with construction and installation activities, useful lives of long-lived assets, share-based compensation and actuarial liabilities associated with certain benefit plans. Actual results could differ from those estimates.

Reclassifications

Certain prior year amounts have been reclassified to conform to the current year presentation.

Principles of Consolidation

The accompanying consolidated financial statements include our accounts and the accounts of all voting interest entities where we exercise a controlling financial interest through the ownership of a direct or indirect controlling voting interest and variable interest entities for which our company is the primary beneficiary. All significant intercompany accounts and transactions have been eliminated in consolidation.

Cash and Cash Equivalents and Restricted Cash

Cash equivalents consist of money market funds and other investments that are readily convertible into cash and have maturities of three months or less at the time of acquisition. We record money market funds at the net asset value as there are no restrictions on our ability, contractual or otherwise, to redeem our investments at the stated net asset value.

Restricted cash consists of cash held in restricted accounts, including cash held as collateral for debt and other compensating balances. Restricted cash amounts that are required to be used to purchase long-term assets or repay long-term debt are classified as long-term assets. All other cash that is restricted to a specific use is classified as current or long-term based on the expected timing of the disbursement.

Our significant non-cash investing and financing activities are disclosed in our consolidated statements of equity and in notes 5, 6, 8, 10, and 11.

Trade Receivables

Our trade receivables are reported net of an allowance for doubtful accounts. Such allowance aggregated \$42.8 million and \$45.8 million at December 31, 2019 and 2018, respectively. The allowance for doubtful accounts is based upon our assessment of probable loss related to uncollectible accounts receivable. We use a number of factors in determining the allowance, including, among other things, collection trends, prevailing and anticipated economic conditions and specific customer credit risk. The allowance is maintained until either payment is received or the likelihood of collection is considered to be remote.

Concentration of credit risk with respect to trade receivables is limited due to the large number of residential and business customers. We also manage this risk by disconnecting services to customers whose accounts are delinquent.

Investments

We make elections, on an investment-by-investment basis, as to whether we measure our investments at fair value. Such elections are generally irrevocable. With the exception of those investments over which we exercise significant influence, we generally elect the fair value method. For those investments over which we exercise significant influence, we generally elect the equity method.

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Under the fair value method, investments are recorded at fair value and any changes in fair value are reported in realized and unrealized gains or losses due to changes in fair values of certain investments and debt, net, in our consolidated statements of operations. All costs directly associated with the acquisition of an investment to be accounted for using the fair value method are expensed as incurred. Under the equity method of accounting, investments are recorded at cost and are subsequently increased or reduced to reflect our share of income or losses of the investee. All costs directly associated with the acquisition of an investment to be accounted for using the equity method are included in the carrying amount of the investment. For additional information regarding our fair value and equity method investments, see notes 7 and 9.

Under the equity method, investments, originally recorded at cost, are adjusted to recognize our share of net earnings or losses of the affiliates as they occur rather than as dividends or other distributions are received, with our recognition of losses generally limited to the extent of our investment in, and advances and commitments to, the investee. The portion of the difference between our investment and our share of the net assets of the investee that represents goodwill is not amortized, but continues to be considered for impairment. Profits on transactions with equity affiliates for which assets remain on our or our investee's balance sheet are eliminated to the extent of our ownership in the investee.

Dividends from publicly-traded investees that are not accounted for under the equity method are recognized when declared as dividend income in our consolidated statements of operations. Dividends from our equity method investees and all of our privately-held investees are reflected as reductions of the carrying values of the applicable investments. Dividends that are deemed to be (i) returns on our investments are included in cash flows from operating activities in our consolidated statements of cash flows and (ii) returns of our investments are included in cash flows from investing activities in our consolidated statements of cash flows.

We continually review all of our equity investments to determine whether a decline in fair value below the cost basis is other-than-temporary. The primary factors we consider in our determination are the extent and length of time that the fair value of the investment is below our company's carrying value and the financial condition, operating performance and near-term prospects of the investee, changes in the stock price or valuation subsequent to the balance sheet date, and the impacts of exchange rates, if applicable. If the decline in fair value of an equity or cost method investment is deemed to be other-than-temporary, the cost basis of the security is written down to fair value.

Realized gains and losses are determined on an average cost basis. Securities transactions are recorded on the trade date.

Financial Instruments

Due to the short maturities of cash and cash equivalents, restricted cash, short-term liquid investments, trade and other receivables, other current assets, accounts payable, accrued liabilities and other accrued and current liabilities, their respective carrying values approximate their respective fair values. For information concerning the fair values of certain of our investments, derivatives and debt, see notes 7, 8 and 11, respectively. For information regarding how we arrive at certain of our fair value measurements, see note 9.

Derivative Instruments

All derivative instruments, whether designated as hedging relationships or not, are recorded on the balance sheet at fair value. If the derivative instrument is not designated as a hedge, changes in the fair value of the derivative instrument are recognized in earnings. If the derivative instrument is designated as a cash flow hedge, the effective portions of changes in the fair value of the derivative instrument are recorded in other comprehensive earnings or loss and subsequently reclassified into our consolidated statements of operations when the hedged forecasted transaction affects earnings. Ineffective portions of changes in the fair value of cash flow hedges are recognized in earnings. With the exception of a limited number of our foreign currency forward contracts, we do not apply hedge accounting to our derivative instruments.

The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. For derivative contracts that are terminated prior to maturity, the cash paid or received upon termination that relates to future periods is classified as a financing activity in our consolidated statement of cash flows.

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For information regarding our derivative instruments, see note 8.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation. We capitalize costs associated with the construction of new cable and mobile transmission and distribution facilities and the installation of new cable services. Capitalized construction and installation costs include materials, labor and other directly attributable costs. Installation activities that are capitalized include (i) the initial connection (or drop) from our cable system to a customer location, (ii) the replacement of a drop and (iii) the installation of equipment for additional services, such as digital cable, telephone or broadband internet service. The costs of other customer-facing activities, such as reconnecting and disconnecting customer locations and repairing or maintaining drops, are expensed as incurred. Interest capitalized with respect to construction activities was not material during any of the periods presented.

Capitalized internal-use software is included as a component of property and equipment. We capitalize internal and external costs directly associated with the development of internal-use software. We also capitalize costs associated with the purchase of software licenses. Maintenance and training costs, as well as costs incurred during the preliminary stage of an internal-use software development project, are expensed as incurred.

Depreciation is computed using the straight-line method over the estimated useful life of the underlying asset. Equipment under finance leases is amortized on a straight-line basis over the shorter of the lease term or estimated useful life of the asset. Useful lives used to depreciate our property and equipment are assessed periodically and are adjusted when warranted. The useful lives of cable and mobile distribution systems that are undergoing a rebuild are adjusted such that property and equipment to be retired will be fully depreciated by the time the rebuild is completed. For additional information regarding the useful lives of our property and equipment, see note 10.

Additions, replacements and improvements that extend the asset life are capitalized. Repairs and maintenance are charged to operations.

We recognize a liability for asset retirement obligations in the period in which it is incurred if sufficient information is available to make a reasonable estimate of fair values. Asset retirement obligations may arise from the loss of rights of way that we obtain from local municipalities or other relevant authorities, as well as our obligations under certain lease arrangements to restore the property to its original condition at the end of the lease term. Given the nature of our operations, most of our rights of way and certain leased premises are considered integral to our business. Accordingly, for most of our rights of way and certain lease agreements, the possibility is remote that we will incur significant removal costs in the foreseeable future and, as such, we do not have sufficient information to make a reasonable estimate of fair value for these asset retirement obligations.

As of December 31, 2019 and 2018, the recorded value of our asset retirement obligations was \$55.5 million and \$53.5 million, respectively.

Intangible Assets

Our primary intangible assets relate to goodwill and customer relationships. Goodwill represents the excess purchase price over the fair value of the identifiable net assets acquired in a business combination. Customer relationships are initially recorded at their fair value in connection with business combinations.

Goodwill and other intangible assets with indefinite useful lives are not amortized, but instead are tested for impairment at least annually. Intangible assets with finite lives are amortized on a straight-line basis over their respective estimated useful lives to their estimated residual values and reviewed for impairment.

For additional information regarding the useful lives of our intangible assets, see note 10.

Impairment of Property and Equipment and Intangible Assets

When circumstances warrant, we review the carrying amounts of our property and equipment and our intangible assets (other than goodwill and other indefinite-lived intangible assets) to determine whether such carrying amounts continue to be recoverable. Such changes in circumstance may include (i) an expectation of a sale or disposal of a long-lived asset or asset group, (ii) adverse changes in market or competitive conditions, (iii) an adverse change in legal factors or business climate in the markets in which

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we operate and (iv) operating or cash flow losses. For purposes of impairment testing, long-lived assets are grouped at the lowest level for which cash flows are largely independent of other assets and liabilities, generally at or below the reporting unit level (see below). If the carrying amount of the asset or asset group is greater than the expected undiscounted cash flows to be generated by such asset or asset group, an impairment adjustment is recognized. Such adjustment is measured by the amount that the carrying value of such asset or asset group exceeds its fair value. We generally measure fair value by considering (a) sale prices for similar assets, (b) discounted estimated future cash flows using an appropriate discount rate and/or (c) estimated replacement cost. Assets to be disposed of are recorded at the lower of their carrying amount or fair value less costs to sell.

We evaluate goodwill and other indefinite-lived intangible assets for impairment at least annually on October 1 and whenever facts and circumstances indicate that their carrying amounts may not be recoverable. For impairment evaluations with respect to both goodwill and other indefinite-lived intangibles, we first make a qualitative assessment to determine if the goodwill or other indefinite-lived intangible may be impaired. In the case of goodwill, if it is more-likely-than-not that a reporting unit's fair value is less than its carrying value, we then compare the fair value of the reporting unit to its respective carrying amount. Any excess of the carrying amount over the fair value would be charged to operations as an impairment loss. A reporting unit is an operating segment or one level below an operating segment (referred to as a "component"). With respect to other indefinite-lived intangible assets, if it is more-likely-than-not that the fair value of an indefinite-lived intangible asset is less than its carrying value, we then estimate its fair value and any excess of the carrying value over the fair value is also charged to operations as an impairment loss.

Leases

For leases with a term greater than 12 months, we recognize on the lease commencement date (i) ROU assets representing our right to use an underlying asset and (ii) lease liabilities representing our obligation to make lease payments over the lease term. Lease and non-lease components in a contract are generally accounted for separately.

We initially measure lease liabilities at the present value of the remaining lease payments over the lease term. Options to extend or terminate the lease are included only when it is reasonably certain that we will exercise that option. As most of our leases do not provide enough information to determine an implicit interest rate, we generally use a portfolio level incremental borrowing rate in our present value calculation. We initially measure ROU assets at the value of the lease liability, plus any initial direct costs and prepaid lease payments, less any lease incentives received.

With respect to our finance leases, (i) ROU assets are generally depreciated on a straight-line basis over the shorter of the lease term or the useful life of the asset and (ii) interest expense on the lease liability is recorded using the effective interest method. Operating lease expense is recognized on a straight-line basis over the lease term. For leases with a term of 12 months or less (short-term leases), we do not recognize ROU assets or lease liabilities. Short-term lease expense is recognized on a straight-line basis over the lease term.

Income Taxes

Income taxes are accounted for under the asset and liability method. We recognize deferred tax assets and liabilities for the future tax consequences attributable to differences between the financial statement carrying amounts and income tax basis of assets and liabilities and the expected benefits of utilizing net operating loss and tax credit carryforwards, using enacted tax rates in effect for each taxing jurisdiction in which we operate for the year in which those temporary differences are expected to be recovered or settled. We recognize the financial statement effects of a tax position when it is more-likely-than-not, based on technical merits, that the position will be sustained upon examination. Net deferred tax assets are then reduced by a valuation allowance if we believe it is more-likely-than-not such net deferred tax assets will not be realized. Certain of our valuation allowances and tax uncertainties are associated with entities that we acquired in business combinations. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in earnings in the period that includes the enactment date. Deferred tax liabilities related to investments in foreign subsidiaries and foreign corporate joint ventures that are essentially permanent in duration are not recognized until it becomes apparent that such amounts will reverse in the foreseeable future. In order to be considered essentially permanent in duration, sufficient evidence must indicate that the foreign subsidiary has invested or will invest its undistributed earnings indefinitely, or that earnings will be remitted in a tax-free manner. Interest and penalties related to income tax liabilities are included in income tax benefit or expense in our consolidated statements of operations.

For additional information regarding our income taxes, see note 13.

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Foreign Currency Translation and Transactions

The reporting currency of our company is the U.S. dollar. The functional currency of our foreign operations generally is the applicable local currency for each foreign subsidiary and equity method investee. Assets and liabilities of foreign subsidiaries (including intercompany balances for which settlement is not anticipated in the foreseeable future) are translated at the spot rate in effect at the applicable reporting date. With the exception of certain material transactions, the amounts reported in our consolidated statements of operations are translated at the average exchange rates in effect during the applicable period. The resulting unrealized cumulative translation adjustment, net of applicable income taxes, is recorded as a component of accumulated other comprehensive earnings or loss in our consolidated statements of equity. With the exception of certain material transactions, the cash flows from our operations in foreign countries are translated at the average rate for the applicable period in our consolidated statements of cash flows. The impacts of material transactions generally are recorded at the applicable spot rates in our consolidated statements of operations and cash flows. The effect of exchange rates on cash balances held in foreign currencies are separately reported in our consolidated statements of cash flows.

Transactions denominated in currencies other than our or our subsidiaries' functional currencies are recorded based on exchange rates at the time such transactions arise. Changes in exchange rates with respect to amounts recorded on our consolidated balance sheets related to these non-functional currency transactions result in transaction gains and losses that are reflected in our consolidated statements of operations as unrealized (based on the applicable period end exchange rates) or realized upon settlement of the transactions.

Revenue Recognition

Service Revenue — Cable Networks. We recognize revenue from the provision of broadband internet, video and fixed-line telephony services over our cable network to customers in the period the related services are provided, with the exception of revenue recognized pursuant to certain contracts that contain promotional discounts, as described below. Installation fees related to services provided over our cable network are generally deferred and recognized as revenue over the contractual period, or longer if the upfront fee results in a material renewal right.

Sale of Multiple Products and Services. We sell broadband internet, video, fixed-line telephony and, in most of our markets, mobile services to our customers in bundled packages at a rate lower than if the customer purchased each product on a standalone basis. Revenue from bundled packages generally is allocated proportionally to the individual products or services based on the relative standalone selling price for each respective product or service.

Mobile Revenue — General. Consideration from mobile contracts is allocated to the airtime service component and the handset component based on the relative standalone selling prices of each component. In markets where we offer handsets and airtime services in separate contracts entered into at the same time, we account for these contracts as a single contract.

Mobile Revenue — Airtime Services. We recognize revenue from mobile services in the period in which the related services are provided. Revenue from pre-pay customers is deferred prior to the commencement of services and recognized as the services are rendered or usage rights expire.

Mobile Revenue — Handset Revenue. Revenue from the sale of handsets is recognized at the point in which the goods have been transferred to the customer. Some of our mobile handset contracts that permit the customer to take control of the handset upfront and pay for the handset in installments over a contractual period may contain a significant financing component. For contracts with terms of one year or more, we recognize any significant financing component as revenue over the contractual period using the effective interest method. We do not record the effect of a significant financing component if the contractual period is less than one year.

B2B Revenue. We defer upfront installation and certain nonrecurring fees received on B2B contracts where we maintain ownership of the installed equipment. The deferred fees are amortized into revenue on a straight-line basis, generally over the longer of the term of the arrangement or the expected period of performance. From time to time, we also enter into agreements with certain B2B customers pursuant to which they are provided the right to use certain elements of our network. If these agreements are determined to contain a lease that meets the criteria to be considered a sales-type lease, we recognize revenue from the lease component when control of the network element is transferred to the customer.

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Contract Costs. Incremental costs to obtain a contract with a customer, such as incremental sales commissions, are generally recognized as assets and amortized to SG&A expenses over the applicable period benefited, which generally is the contract life. If, however, the amortization period is less than one year, we expense such costs in the period incurred. Contract fulfillment costs, such as costs for installation activities for B2B customers, are recognized as assets and amortized to other operating costs over the applicable period benefited, which is generally the substantive contract term for the related service contract.

Promotional Discounts. For subscriber promotions, such as discounted or free services during an introductory period, revenue is recognized uniformly over the contractual period if the contract has substantive termination penalties. If a contract does not have substantive termination penalties, revenue is recognized only to the extent of the discounted monthly fees charged to the subscriber, if any.

Subscriber Advance Payments. Payments received in advance for the services we provide are deferred and recognized as revenue when the associated services are provided.

Sales, Use and Other Value-Added Taxes. Revenue is recorded net of applicable sales, use and other value-added taxes.

For additional information regarding our revenue recognition and related costs, see note 4. For a disaggregation of our revenue by major category and by reportable and geographic segment, see note 20.

Share-based Compensation

We recognize all share-based payments to employees, including grants of employee share-based incentive awards, based on their grant-date fair values and our estimates of forfeitures. We recognize the grant-date fair value of outstanding awards as a charge to operations over the vesting period. Our share of payroll taxes incurred in connection with the vesting or exercise of our share-based incentive awards are recorded as a component of share-based compensation expense in our consolidated statements of operations.

We use the straight-line method to recognize share-based compensation expense for our outstanding share awards that do not contain a performance condition and the accelerated expense attribution method for our outstanding share awards that contain a performance condition and vest on a graded basis.

The grant date fair values for options, share appreciation rights (**SARs**) and performance-based share appreciation rights (**PSARs**) are estimated using the Black-Scholes option pricing model, and the grant date fair values for restricted share units (**RSUs**), restricted share awards (**RSAs**) and performance-based restricted share units (**PSUs**) are based upon the closing share price of Liberty Global ordinary shares on the date of grant. We consider historical exercise trends in our calculation of the expected life of options and SARs granted by Liberty Global to employees. The expected volatility for options and SARs related to our ordinary shares is generally based on a combination of (i) historical volatilities for a period equal to the expected average life of the awards and (ii) volatilities implied from publicly-traded options for our shares.

We generally issue new Liberty Global ordinary shares when Liberty Global options or SARs are exercised, when RSUs and PSUs vest and when RSAs are granted. Although we repurchase Liberty Global ordinary shares from time to time, the parameters of our share purchase and redemption activities are not established with reference to the dilutive impact of our share-based compensation plans.

For additional information regarding our share-based compensation, see note 15.

Litigation Costs

Legal fees and related litigation costs are expensed as incurred.

Earnings or Loss per Share

Basic earnings or loss per share (**EPS**) is computed by dividing net earnings or loss by the weighted average number of shares outstanding for the period. Diluted EPS presents the dilutive effect, if any, on a per share basis of potential shares (e.g., options, SARs, RSUs, RSAs, PSARs and PSUs) as if they had been exercised, vested or converted at the beginning of the periods presented.

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The details of our net loss from continuing operations attributable to Liberty Global shareholders are set forth below:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Loss from continuing operations	\$ (1,409.0)	\$ (1,411.5)	\$ (2,350.0)
Net earnings from continuing operations attributable to noncontrolling interests	(116.8)	(120.5)	(71.4)
Net loss from continuing operations attributable to Liberty Global shareholders	\$ (1,525.8)	\$ (1,532.0)	\$ (2,421.4)

We reported losses from continuing operations attributable to Liberty Global shareholders during 2019, 2018 and 2017. Therefore, the potentially dilutive effect at December 31, 2019, 2018 and 2017 of the following items was not included in the computation of diluted loss from continuing operations attributable to Liberty Global shareholders per share because their inclusion would have been anti-dilutive to the computation or, in the case of certain PSARs and PSUs, because such awards had not yet met the applicable performance criteria: (i) the aggregate number of shares issuable pursuant to outstanding options, SARs and RSUs of 62.5 million, 58.7 million and 53.7 million, respectively, and (ii) the aggregate number of shares issuable pursuant to PSARs and PSUs of 23.9 million, 9.2 million and 6.2 million, respectively.

(4) Revenue Recognition and Related Costs

Contract Balances

If we transfer goods or services to a customer but do not have an unconditional right to payment, we record a contract asset. Contract assets typically arise from the uniform recognition of introductory promotional discounts over the contract period and accrued revenue for handset sales. Our contract assets were \$30.6 million and \$44.3 million as of December 31, 2019 and 2018, respectively. The current and long-term portions of our contract asset balances are included within other current assets and other assets, net, respectively, on our consolidated balance sheets.

We record deferred revenue when we receive payment prior to transferring goods or services to a customer. We primarily defer revenue for (i) installation and other upfront services and (ii) other services that are invoiced prior to when services are provided. Our deferred revenue balances were \$867.1 million and \$877.9 million as of December 31, 2019 and 2018, respectively. The decrease in deferred revenue during 2019 is primarily due to \$805.0 million of revenue recognized that was included in our deferred revenue balance at December 31, 2018, partially offset by advanced billings in certain markets. The long-term portions of our deferred revenue balances are included within other long-term liabilities on our consolidated balance sheets.

Contract Costs

Our aggregate assets associated with incremental costs to obtain and fulfill our contracts were \$92.6 million and \$73.0 million at December 31, 2019 and 2018, respectively. The current and long-term portions of our assets related to contract costs are included within other current assets and other assets, net, respectively, on our consolidated balance sheets. During 2019 and 2018, we amortized \$101.1 million and \$99.8 million, respectively, to operating costs and expenses related to these assets.

Unsatisfied Performance Obligations

A large portion of our revenue is derived from customers who are not subject to contracts. Revenue from customers who are subject to contracts is generally recognized over the term of such contracts, which is typically 12 months for our residential service contracts, one to three years for our mobile service contracts and one to five years for our B2B service contracts.

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(5) Acquisitions

2019 Acquisition

De Vijver Media. Prior to June 3, 2019, Telenet owned a 50.0% equity method investment in De Vijver Media NV (**De Vijver Media**), which provides content production, broadcasting and advertising services in Belgium. On June 3, 2019, Telenet acquired the remaining 50.0% ownership interest in De Vijver Media (the **De Vijver Media Acquisition**) for cash consideration of €52.5 million (\$58.9 million at the transaction date) after post-closing adjustments. Immediately following this transaction, Telenet repaid in full De Vijver Media's €62.0 million (\$69.5 million at the transaction date) of outstanding third-party debt. In connection with the De Vijver Media Acquisition, we recognized a \$25.7 million gain during the second quarter of 2019, representing the difference between the fair value of \$57.9 million and carrying amount of our then-existing 50.0% ownership interest in De Vijver Media. This gain is included in other income, net, in our consolidated statement of operations.

2017 Acquisition

SFR BeLux. On June 19, 2017, Telenet acquired Coditel Brabant sprl, operating under the SFR brand (**SFR BeLux**), for a cash and debt free purchase price of €369.0 million (\$410.3 million at the applicable rates) (the **SFR BeLux Acquisition**) after post-closing adjustments. SFR BeLux provides cable and mobile services to households and businesses in Belgium and Luxembourg. The SFR BeLux Acquisition was funded through a combination of €210.0 million (\$234.3 million at the transaction date) of borrowings under the Telenet Credit Facility (as defined and described in note 11) and existing liquidity of Telenet.

(6) Dispositions and the VodafoneZiggo JV Transaction

Dispositions

Vodafone Disposal Group

On July 31, 2019, we completed the sale of our operations in Germany, Romania, Hungary and the Czech Republic to Vodafone Group plc (**Vodafone**). The operations of Germany, Romania, Hungary and the Czech Republic are collectively referred to herein as the "**Vodafone Disposal Group**."

After considering debt and working capital adjustments (including cash disposed) and €183.7 million (\$205.8 million at the transaction date) of cash paid by our company to settle centrally-held vendor financing obligations associated with the Vodafone Disposal Group, we received net cash proceeds of €10.0 billion (\$11.1 billion at the applicable rates). In August 2019, we used a portion of the net proceeds from the sale of the Vodafone Disposal Group to prepay in full the \$1,645.0 million outstanding principal amount on a U.S. dollar-denominated term loan facility under the UPC Holding Bank Facility. Pursuant to the agreement underlying the sale of the Vodafone Disposal Group, we transferred cash to fund certain third-party escrow accounts (the **Vodafone Escrow Accounts**) pending the fulfillment by our company of certain terms of the agreement. The current and long-term portions of the receivables associated with the Vodafone Escrow Accounts are included in "other current assets" and "other assets, net", respectively, on our consolidated balance sheet. As of December 31, 2019, the aggregate balance of the Vodafone Escrow Accounts was \$295.2 million.

In connection with the sale of the Vodafone Disposal Group, we recognized a gain of \$12.2 billion that includes cumulative foreign currency translation gains of \$88.2 million and income taxes of \$35.4 million.

In connection with the sale of the Vodafone Disposal Group, we have agreed to provide certain transitional services to Vodafone for a period of up to four years. These services principally comprise network and information technology-related functions. During 2019, we recorded revenue of \$63.1 million associated with these transitional services.

For information regarding certain tax indemnities we provided in connection with the sale of the Vodafone Disposal Group, see note 19.

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UPC DTH

On May 2, 2019, we completed the sale of UPC DTH to M7 Group (**M7**). After considering debt and working capital adjustments (including cash disposed), we received net cash proceeds of €128.9 million (\$144.1 million at the applicable rates). The proceeds from the sale of UPC DTH were used for general corporate purposes.

In connection with the sale of UPC DTH, we recognized a gain of \$106.0 million that includes cumulative foreign currency translation losses of \$10.0 million. No income taxes were required to be provided on this gain.

In connection with the sale of UPC DTH, we have agreed to provide certain transitional services to M7 for a period of up to two years. These services principally comprise network and information technology-related functions. During 2019, we recorded revenue of \$1.4 million associated with these transitional services.

UPC Austria

On July 31, 2018, we completed the sale of our Austrian operations, “**UPC Austria**,” to Deutsche Telekom AG (**Deutsche Telekom**). After considering debt, working capital and noncontrolling interest adjustments and \$35.5 million (equivalent at the transaction date) of cash paid by our company to settle centrally-held vendor financing obligations associated with UPC Austria, we received net cash proceeds of \$2,058.2 million (equivalent at the applicable rates). A portion of the net proceeds were used to repay or redeem an aggregate \$1.5 billion (equivalent at the applicable dates) principal amount of our outstanding debt, including (i) the repayment of \$913.4 million (equivalent at the repayment date) principal amount under the UPC Holding Bank Facility, (ii) the redemption of \$69.6 million (equivalent at the redemption date) principal amount of the UPCB SPE Notes and (iii) the redemption of \$515.5 million (equivalent at the redemption date) principal amount of the VM Notes. The remaining net proceeds from the sale of UPC Austria were made available for general corporate purposes, including an additional \$500.0 million of share repurchases.

In connection with the sale of UPC Austria, we recognized a gain of \$1,098.1 million that includes cumulative foreign currency translation gains of \$79.5 million. No income taxes were required to be provided on this gain, which is included in gain on disposal of discontinued operations, net of taxes, in our consolidated statement of operations.

In connection with the sale of UPC Austria, we have agreed to provide certain transitional services to Deutsche Telekom for a period of up to four years. These services principally comprise network and information technology-related functions. During 2019 and 2018, we recorded revenue of \$42.8 million and \$17.9 million, respectively, associated with these transitional services.

In October of 2019, we received notification of certain claims made by Deutsche Telekom related to our disposal of UPC Austria. For additional information, see note 19.

Split-off Transaction

On December 29, 2017, in order to effect the split-off of the LiLAC Group (the **Split-off Transaction**), we distributed 100% of the common shares (the **Distribution**) of Liberty Latin America Ltd. (**Liberty Latin America**) to the holders of our then outstanding LiLAC Shares. Just prior to the completion of the Split-off Transaction, all of the businesses, assets and liabilities of the LiLAC Group were transferred to Liberty Latin America, which was then a wholly-owned subsidiary of Liberty Global. Following the Distribution, the LiLAC Shares were redesignated as deferred shares (which had virtually no economic rights) and Liberty Latin America became an independent publicly-traded company that is no longer consolidated by Liberty Global. No gain or loss was recognized in connection with the Split-off Transaction.

Presentation of Discontinued Operations

The operations of the Vodafone Disposal Group, UPC Austria and UPC DTH are presented as discontinued operations in our consolidated financial statements for all applicable periods. In connection with the signing of each respective sale agreement, we ceased to depreciate or amortize the long-lived assets of (i) UPC Austria on December 22, 2017, (ii) the Vodafone Disposal Group on May 9, 2018 and (iii) UPC DTH on December 21, 2018. Our operations in Austria, Romania, Hungary and the Czech Republic as well as the operations of UPC DTH were held through UPC Holding prior to their respective disposal dates. No debt, interest expense or derivative instruments of the UPC Holding borrowing group, other than with respect to certain borrowings that are direct obligations of the entities that were disposed, has been allocated to discontinued operations. Conversely, all of Unitymedia’s debt, interest expense and derivative instruments through the disposal date has been included in discontinued operations as its

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debt and derivative instruments are direct obligations of entities within the Vodafone Disposal Group. A portion of the proceeds from the disposition of UPC Austria was used to reduce the outstanding debt of the UPC Holding borrowing group.

In addition, the entities comprising the LiLAC Group are reflected as discontinued operations in our consolidated statements of operations and cash flows for the year ended December 31, 2017.

The carrying amounts of the major classes of assets and liabilities of the Vodafone Disposal Group and UPC DTH as of December 31, 2018 are summarized below. These amounts exclude intercompany assets and liabilities that are eliminated within our consolidated balance sheet.

	Vodafone Disposal Group	UPC DTH	Total
	in millions		
Assets:			
Current assets other than cash	\$ 348.0	\$ 8.5	\$ 356.5
Property and equipment, net	5,591.4	79.7	5,671.1
Goodwill	3,986.7	—	3,986.7
Other assets, net	509.4	7.4	516.8
Total assets	\$ 10,435.5	\$ 95.6	\$ 10,531.1
Liabilities:			
Current portion of debt and finance lease obligations	\$ 809.0	\$ 11.2	\$ 820.2
Other accrued and current liabilities	1,114.8	32.5	1,147.3
Long-term debt and finance lease obligations	9,037.1	37.5	9,074.6
Other long-term liabilities	997.5	0.3	997.8
Total liabilities	\$ 11,958.4	\$ 81.5	\$ 12,039.9

The operating results of UPC Austria, the Vodafone Disposal Group, UPC DTH and the LiLAC Group for the periods indicated are summarized in the following tables. These amounts exclude intercompany revenue and expenses that are eliminated within our consolidated statements of operations.

	Vodafone Disposal Group (a)	UPC DTH (b)	Total
	in millions		
<i>Year ended December 31, 2019</i>			
Revenue	\$ 2,017.9	\$ 36.7	\$ 2,054.6
Operating income	\$ 1,165.6	\$ 10.7	\$ 1,176.3
Earnings before income taxes	\$ 994.7	\$ 9.5	\$ 1,004.2
Income tax expense	(273.9)	—	(273.9)
Net earnings attributable to Liberty Global shareholders	\$ 720.8	\$ 9.5	\$ 730.3

(a) Includes the operating results of the Vodafone Disposal Group from January 1, 2019 through the July 31, 2019 disposal date.

(b) Includes the operating results of the UPC DTH from January 1, 2019 through the May 2, 2019 disposal date.

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	UPC Austria (a)	Vodafone Disposal Group	UPC DTH	Total
	in millions			
<i>Year ended December 31, 2018</i>				
Revenue	\$ 252.4	\$ 3,584.2	\$ 117.0	\$ 3,953.6
Operating income	\$ 139.0	\$ 1,787.0	\$ 11.7	\$ 1,937.7
Earnings before income taxes	\$ 138.7	\$ 1,396.3	\$ 9.6	\$ 1,544.6
Income tax benefit (expense)	(23.3)	(365.2)	7.3	(381.2)
Net earnings	115.4	1,031.1	16.9	1,163.4
Net earnings attributable to noncontrolling interests	(4.2)	—	—	(4.2)
Net earnings attributable to Liberty Global shareholders	\$ 111.2	\$ 1,031.1	\$ 16.9	\$ 1,159.2

(a) Includes the operating results of UPC Austria from January 1, 2018 through the July 31, 2018 disposal date.

	UPC Austria	Vodafone Disposal Group	UPC DTH	LiLAC Group	Total
	in millions				
<i>Year ended December 31, 2017</i>					
Revenue	\$ 394.9	\$ 3,263.0	\$ 114.6	\$ 3,590.0	\$ 7,362.5
Operating income (loss)	\$ 150.0	\$ 976.0	\$ 11.7	\$ (162.9)	\$ 974.8
Earnings (loss) before income taxes	\$ 150.0	\$ 395.4	\$ 9.7	\$ (651.1)	\$ (96.0)
Income tax expense	(4.5)	(66.1)	—	(204.0)	(274.6)
Net earnings (loss)	145.5	329.3	9.7	(855.1)	(370.6)
Net loss (earnings) attributable to noncontrolling interests	(6.8)	—	—	20.6	13.8
Net earnings (loss) attributable to Liberty Global shareholders	\$ 138.7	\$ 329.3	\$ 9.7	\$ (834.5)	\$ (356.8)

Our basic and diluted earnings from discontinued operations attributable to Liberty Global shareholders per Liberty Global Share (as defined in note 14) for 2019, 2018 and 2017 is presented below.

	Year ended December 31,		
	2019	2018	2017
Basic and diluted earnings from discontinued operations attributable to Liberty Global shareholders per Liberty Global share	\$ 1.03	\$ 1.49	\$ 0.56

Our basic and diluted loss from discontinued operations attributable to Liberty Global shareholders per LiLAC Share (as defined in note 14) for 2017 is presented below. These amounts relate to the operations of the LiLAC Group.

	Year ended December 31, 2017
Basic and diluted loss from discontinued operations attributable to Liberty Global shareholders per LiLAC share	\$ (4.86)
Weighted average ordinary shares outstanding (LiLAC Shares) - basic and diluted	171,846,133

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VodafoneZiggo JV Transaction

On December 31, 2016, pursuant to a Contribution and Transfer Agreement with Vodafone and one of its wholly-owned subsidiaries, we and Liberty Global Europe Holding B.V., our wholly-owned subsidiary, contributed VodafoneZiggo Holding B.V. (**VodafoneZiggo Holding**) and its subsidiaries (including Liberty Global Netherlands Content B.V.) to VodafoneZiggo Group Holding B.V., a 50:50 joint venture (referred to herein as the “**VodafoneZiggo JV**”). The VodafoneZiggo JV combined VodafoneZiggo Holding with Vodafone’s mobile businesses in the Netherlands to create a national unified communications provider in the Netherlands with complementary strengths across video, broadband internet, fixed-line telephony, mobile and B2B services (the **VodafoneZiggo JV Transaction**). For additional information regarding our investment in the VodafoneZiggo JV, see note 7.

During 2017, in connection with the completion of the VodafoneZiggo JV Transaction, our company received cash of €2.2 billion (\$2.4 billion at the transaction dates) comprising (i) our 50% share of the €2.8 billion (\$2.9 billion at the transaction date) of net proceeds from the various debt financing arrangements entered into by certain subsidiaries of VodafoneZiggo Holding during the third quarter of 2016, which proceeds were held in escrow through December 31, 2016, and (ii) an equalization payment from Vodafone of €806.8 million (\$845.3 million at the transaction dates) that was subject to post-closing adjustments.

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(7) Investments

The details of our investments are set forth below:

Accounting Method	December 31,	
	2019	2018
	in millions	
Equity (a):		
VodafoneZiggo JV (b)	\$ 3,174.1	\$ 3,761.5
All3Media Group (All3Media)	172.8	72.2
Formula E Holdings Ltd (Formula E)	105.2	45.4
Other	40.7	67.9
Total — equity	3,492.8	3,947.0
Fair value:		
ITV plc (ITV) — subject to re-use rights (c)	798.1	634.2
ITI Neovision S.A. (ITI Neovision)	122.4	125.4
Lions Gate Entertainment Corp (Lionsgate) (c)	68.0	77.5
Casa Systems, Inc. (Casa)	3.1	39.5
Other	297.6	298.2
Total — fair value	1,289.2	1,174.8
Total	\$ 4,782.0	\$ 5,121.8

- (a) Our equity method investments are originally recorded at cost and are adjusted to recognize our share of net earnings or losses of affiliates as they occur rather than as dividends or other distributions are received, with our recognition of losses generally limited to the extent of our investment in, and advances and commitments to, the investee. At December 31, 2019 and 2018, the aggregate carrying amounts of our equity method investments exceeded our proportionate share of the respective investee's net assets by \$1,041.0 million and \$1,016.9 million, respectively, which include amounts associated with the VodafoneZiggo JV Receivable, as defined and described below, and amounts we are owed under a long-term note receivable from All3Media.
- (b) Amounts include a euro-denominated note receivable (the **VodafoneZiggo JV Receivable**) with a principal amount of \$786.1 million and \$916.1 million, respectively, due from a subsidiary of the VodafoneZiggo JV to a subsidiary of Liberty Global. The VodafoneZiggo JV Receivable bears interest at 5.55% and matures on January 16, 2028. In each of 2019, 2018 and 2017, we received a €100.0 million principal payment on the VodafoneZiggo JV Receivable (\$112.1 million, \$114.5 million and \$118.5 million at the respective transaction dates). During 2019, interest accrued on the VodafoneZiggo JV Receivable was \$50.4 million, all of which was cash settled.
- (c) In connection with our investments in ITV and Lionsgate, we have entered into the ITV Collar and Lionsgate Forward, respectively, as defined and described below.

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Fair Value Investments

The following table sets forth the details of our realized and unrealized gains (losses) due to changes in fair values of certain investments, net:

	Year ended December 31,		
	2019	2018	2017
	in millions		
ITV	\$ 163.9	\$ (257.8)	\$ (123.5)
Lionsgate	(25.0)	(86.4)	35.3
Casa	(24.2)	(9.2)	47.9
ITI Neovision	2.7	(24.9)	15.8
Sumitomo	—	(3.4)	238.2
Other, net	(18.4)	(11.5)	14.4
Total	<u>\$ 99.0</u>	<u>\$ (393.2)</u>	<u>\$ 228.1</u>

Equity Method Investments

The following table sets forth the details of our share of results of affiliates, net:

	Year ended December 31,		
	2019	2018	2017
	in millions		
VodafoneZiggo JV (a)	\$ (185.9)	\$ 11.4	\$ (70.1)
All3Media	(8.8)	(19.2)	(25.5)
Formula E	1.7	(0.2)	(1.5)
Other	(5.5)	(0.7)	1.9
Total	<u>\$ (198.5)</u>	<u>\$ (8.7)</u>	<u>\$ (95.2)</u>

- (a) Amounts include the net effect of (i) 100% of the interest earned on the VodafoneZiggo JV Receivable and (ii) our 50% share of the remaining results of operations of the VodafoneZiggo JV.

VodafoneZiggo JV. Each of Liberty Global and Vodafone (each a “Shareholder”) holds 50% of the issued share capital of the VodafoneZiggo JV. The Shareholders intend for the VodafoneZiggo JV to be funded solely from its net cash flow from operations and third-party financing. We account for our 50% interest in the VodafoneZiggo JV as an equity method investment. We consider the VodafoneZiggo JV to be a related party. For additional information regarding formation of the VodafoneZiggo JV, see note 6.

In connection with the formation of the VodafoneZiggo JV, the Shareholders entered into a shareholders agreement (the **Shareholders Agreement**). The Shareholders Agreement contains customary provisions for the governance of a 50:50 joint venture that result in Liberty Global and Vodafone having joint control over decision making with respect to the VodafoneZiggo JV.

The Shareholders Agreement also provides (i) for a dividend policy that requires the VodafoneZiggo JV to distribute all unrestricted cash to the Shareholders every two months (subject to the VodafoneZiggo JV maintaining a minimum amount of cash and complying with the terms of its financing arrangements) and (ii) that the VodafoneZiggo JV will be managed with a leverage ratio of between 4.5 and 5.0 times EBITDA (as calculated pursuant to its existing financing arrangements) with the VodafoneZiggo JV undertaking periodic recapitalizations and/or refinancings accordingly.

Each Shareholder has the right to initiate an initial public offering (**IPO**) of the VodafoneZiggo JV after December 31, 2019, with the opportunity for the other Shareholder to sell shares in the IPO on a pro rata basis. Subject to certain exceptions, the Shareholders Agreement prohibits transfers of interests in the VodafoneZiggo JV to third parties until December 31, 2020. After December 31, 2020, each Shareholder will be able to initiate a sale of all of its interest in the VodafoneZiggo JV to a third party.

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and, under certain circumstances, initiate a sale of the entire VodafoneZiggo JV, subject, in each case, to a right of first offer in favor of the other Shareholder.

During the first quarter of 2017, we paid \$162.6 million of VAT on behalf of the VodafoneZiggo JV associated with the termination of a services agreement with Ziggo Group Holding B.V. that was in effect prior to the closing of the VodafoneZiggo JV Transaction. This advance was repaid during the first quarter of 2017. In addition, during 2019, 2018 and 2017, we received dividend distributions from the VodafoneZiggo JV of \$162.7 million, \$232.5 million and \$252.8 million, respectively, which were accounted for as returns on capital for purposes of our consolidated statements of cash flows.

Pursuant to an agreement entered into in connection with the formation of the VodafoneZiggo JV, (the **Framework Agreement**), Liberty Global provides certain services to the VodafoneZiggo JV on a transitional or ongoing basis (collectively, the **JV Services**). The JV Services provided by Liberty Global consist primarily of (i) technology and other services and (ii) capital-related expenditures for assets that will be used by, or will otherwise benefit, the VodafoneZiggo JV. Liberty Global charges both fixed and usage-based fees to the VodafoneZiggo JV for the JV Services provided during the term of the Framework Agreement. During 2019, 2018 and 2017, we recorded revenue from the VodafoneZiggo JV of \$189.1 million, \$189.1 million and \$132.4 million, respectively, primarily related to (a) the JV Services and (b) during 2019 and 2018, sales of customer premises equipment at a mark-up. In addition, during 2019, 2018 and 2017, we purchased certain assets on the VodafoneZiggo JV's behalf with an aggregate cost of \$14.4 million, \$13.1 million and \$144.7 million, respectively. At December 31, 2019 and 2018, \$19.3 million and \$24.4 million, respectively, were due from the VodafoneZiggo JV related to the aforementioned transactions. The amounts due from the VodafoneZiggo JV, which are periodically cash settled, are included in other current assets on our consolidated balance sheets.

The VodafoneZiggo JV is experiencing significant competition. In particular, the mobile operations of the VodafoneZiggo JV continue to experience competitive pressure on pricing. In light of this competition, as well as regulatory and economic factors, we could conclude in future periods that our investment in the VodafoneZiggo JV is impaired or management of the VodafoneZiggo JV could conclude that an impairment of the VodafoneZiggo JV's goodwill and, to a lesser extent, long-lived assets, is required. Any such impairment of the VodafoneZiggo JV's goodwill or our investment in the VodafoneZiggo JV would be reflected as a component of share of results of affiliates, net, in our consolidated statement of operations. Our share of any such impairment charges could be significant.

The summarized results of operations of the VodafoneZiggo JV are set forth below:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Revenue	\$ 4,407.8	\$ 4,602.2	\$ 4,512.5
Loss before income taxes	\$ (512.5)	\$ (467.8)	\$ (362.9)
Net loss	\$ (470.0)	\$ (91.6)	\$ (259.3)

The summarized financial position of the VodafoneZiggo JV is set forth below:

	December 31,	
	2019	2018
	in millions	
Current assets	\$ 918.4	\$ 1,099.6
Long-term assets	21,508.1	22,155.7
Total assets	\$ 22,426.5	\$ 23,255.3
Current liabilities	\$ 2,726.4	\$ 2,812.3
Long-term liabilities	14,920.7	14,751.5
Owners' equity	4,779.4	5,691.5
Total liabilities and owners' equity	\$ 22,426.5	\$ 23,255.3

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Fair Value Investments

ITV. At December 31, 2019 and 2018, we owned 398,515,510 shares of ITV, a commercial broadcaster in the U.K. Our ITV shares represented less than 10.0% of the total outstanding shares of ITV as of June 30, 2019, the most current publicly-available information. The aggregate purchase price paid to acquire our investment in ITV was financed through borrowings under secured borrowing agreements (the **ITV Collar Loan**). All of the ITV shares we hold are subject to a share collar (the **ITV Collar**) and pledged as collateral under the ITV Collar Loan. Under the terms of the ITV Collar, the counterparty has the right to re-use all of the pledged ITV shares. For additional information regarding the ITV Collar, see note 8.

ITI Neovision. At December 31, 2019 and 2018, we owned a 17.0% interest in ITI Neovision, a privately-held DTH operator in Poland.

Lionsgate. At December 31, 2019 and 2018, we owned 4.0 million and 2.5 million voting shares, respectively, and 2.5 million non-voting shares of Lionsgate common stock, which represented less than 5% of the total outstanding shares of Lionsgate. Certain of our voting and non-voting Lionsgate shares are subject to a variable prepaid forward transaction (the **Lionsgate Forward**), as further described in note 8.

Casa. At December 31, 2019 and 2018, we owned 787,074 and 3,005,307 shares, respectively, of Casa common stock. Casa is a U.S.-based provider of fixed, mobile, optical and Wi-Fi network software solutions for ultra-broadband services. Our Casa shares represented less than 1.0% of the total outstanding shares of Casa as of October 31, 2019, the most current publicly-available information.

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(8) Derivative Instruments

In general, we enter into derivative instruments to protect against (i) increases in the interest rates on our variable-rate debt, (ii) foreign currency movements, particularly with respect to borrowings that are denominated in a currency other than the functional currency of the borrowing entity, and (iii) decreases in the market prices of certain publicly traded securities that we own. In this regard, through our subsidiaries, we have entered into various derivative instruments to manage interest rate exposure and foreign currency exposure primarily with respect to the U.S. dollar (\$), the euro (€), the British pound sterling (£), the Swiss franc (CHF) and the Polish zloty (PLN). We do not apply hedge accounting to our derivative instruments. Accordingly, changes in the fair values of most of our derivative instruments are recorded in realized and unrealized gains or losses on derivative instruments, net, in our consolidated statements of operations.

The following table provides details of the fair values of our derivative instrument assets and liabilities:

	December 31, 2019			December 31, 2018		
	Current	Long-term	Total	Current	Long-term	Total
in millions						
Assets (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 270.8	\$ 886.4	\$ 1,157.2	\$ 372.7	\$ 1,370.1	\$ 1,742.8
Equity-related derivative instruments (c)	55.2	608.2	663.4	13.9	732.4	746.3
Foreign currency forward and option contracts	4.6	1.4	6.0	7.2	—	7.2
Other	0.5	0.4	0.9	0.4	—	0.4
Total	<u>\$ 331.1</u>	<u>\$ 1,496.4</u>	<u>\$ 1,827.5</u>	<u>\$ 394.2</u>	<u>\$ 2,102.5</u>	<u>\$ 2,496.7</u>
Liabilities (a):						
Cross-currency and interest rate derivative contracts (b)	\$ 389.2	\$ 1,192.3	\$ 1,581.5	\$ 326.5	\$ 1,042.2	\$ 1,368.7
Equity-related derivative instruments (c)	—	—	—	1.4	—	1.4
Foreign currency forward and option contracts	1.2	—	1.2	0.5	—	0.5
Other	—	—	—	—	0.1	0.1
Total	<u>\$ 390.4</u>	<u>\$ 1,192.3</u>	<u>\$ 1,582.7</u>	<u>\$ 328.4</u>	<u>\$ 1,042.3</u>	<u>\$ 1,370.7</u>

- (a) Our current derivative liabilities, long-term derivative assets and long-term derivative liabilities are included in other current and accrued liabilities, other assets, net, and other long-term liabilities, respectively, on our consolidated balance sheets.
- (b) We consider credit risk relating to our and our counterparties' nonperformance in the fair value assessment of our derivative instruments. In all cases, the adjustments take into account offsetting liability or asset positions within each of our subsidiary borrowing groups (as defined and described in note 11). The changes in the credit risk valuation adjustments associated with our cross-currency and interest rate derivative contracts resulted in net gains (losses) of \$16.6 million, (\$71.1 million) and \$168.4 million during 2019, 2018 and 2017, respectively. These amounts are included in realized and unrealized gains (losses) on derivative instruments, net, in our consolidated statements of operations. For further information regarding our fair value measurements, see note 9.
- (c) Our equity-related derivative instruments primarily include the fair value of (i) theITV Collar and (ii) the Lionsgate Forward. The fair values of the ITV Collar and the Lionsgate Forward do not include credit risk valuation adjustments as we assume that any losses incurred by our company in the event of nonperformance by the respective counterparty would be, subject to relevant insolvency laws, fully offset against amounts we owe to such counterparty pursuant to the related secured borrowing arrangements.

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The details of our realized and unrealized gains (losses) on derivative instruments, net, are as follows:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Cross-currency and interest rate derivative contracts	\$ (207.3)	\$ 905.8	\$ (1,145.6)
Equity-related derivative instruments:			
ITV Collar	(84.4)	176.7	215.0
Lionsgate Forward	13.0	30.1	(11.4)
Sumitomo Collar (a)	—	(11.8)	(77.4)
Other	8.0	2.5	(3.9)
Total equity-related derivative instruments	(63.4)	197.5	122.3
Foreign currency forward and option contracts	77.4	22.7	(30.2)
Other	1.3	(0.2)	0.7
Total	<u>\$ (192.0)</u>	<u>\$ 1,125.8</u>	<u>\$ (1,052.8)</u>

- (a) On May 22, 2018, we settled the final tranche of the share collar (the **Sumitomo Collar**) and related borrowings with a portion of the existing Sumitomo shares held by our company. The aggregate market value of these shares on the transaction date was \$159.3 million.

The net cash received or paid related to our derivative instruments is classified as an operating, investing or financing activity in our consolidated statements of cash flows based on the objective of the derivative instrument and the classification of the applicable underlying cash flows. For derivative contracts that are terminated prior to maturity, the cash paid or received upon termination that relates to future periods is classified as a financing activity. The following table sets forth the classification of the net cash inflows (outflows) of our derivative instruments:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Operating activities	\$ 179.0	\$ 244.4	\$ 6.8
Investing activities	—	—	(0.5)
Financing activities	331.5	112.8	(138.1)
Total	<u>\$ 510.5</u>	<u>\$ 357.2</u>	<u>\$ (131.8)</u>

Counterparty Credit Risk

We are exposed to the risk that the counterparties to the derivative instruments of our subsidiary borrowing groups will default on their obligations to us. We manage these credit risks through the evaluation and monitoring of the creditworthiness of, and concentration of risk with, the respective counterparties. In this regard, credit risk associated with our derivative instruments is spread across a relatively broad counterparty base of banks and financial institutions. With the exception of a limited number of instances where we have required a counterparty to post collateral, neither party has posted collateral under the derivative instruments of our subsidiary borrowing groups. At December 31, 2019, our exposure to counterparty credit risk included derivative assets with an aggregate fair value of \$253.2 million.

Each of our subsidiary borrowing groups have entered into derivative instruments under master agreements with each counterparty that contain master netting arrangements that are applicable in the event of early termination by either party to such derivative instrument. The master netting arrangements are limited to the derivative instruments and derivative-related debt instruments, governed by the relevant master agreement within each individual borrowing group and are independent of similar arrangements of our other subsidiary borrowing groups.

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Under our derivative contracts, it is generally only the non-defaulting party that has a contractual option to exercise early termination rights upon the default of the other counterparty and to set off other liabilities against sums due upon such termination. However, in an insolvency of a derivative counterparty, under the laws of certain jurisdictions, the defaulting counterparty or its insolvency representatives may be able to compel the termination of one or more derivative contracts and trigger early termination payment liabilities payable by us, reflecting any mark-to-market value of the contracts for the counterparty. Alternatively, or in addition, the insolvency laws of certain jurisdictions may require the mandatory set off of amounts due under such derivative contracts against present and future liabilities owed to us under other contracts between us and the relevant counterparty. Accordingly, it is possible that we may be subject to obligations to make payments, or may have present or future liabilities owed to us partially or fully discharged by set off as a result of such obligations, in the event of the insolvency of a derivative counterparty, even though it is the counterparty that is in default and not us. To the extent that we are required to make such payments, our ability to do so will depend on our liquidity and capital resources at the time. In an insolvency of a defaulting counterparty, we will be an unsecured creditor in respect of any amount owed to us by the defaulting counterparty, except to the extent of the value of any collateral we have obtained from that counterparty.

In addition, where a counterparty is in financial difficulty, under the laws of certain jurisdictions, the relevant regulators may be able to (i) compel the termination of one or more derivative instruments, determine the settlement amount and/or compel, without any payment, the partial or full discharge of liabilities arising from such early termination that are payable by the relevant counterparty or (ii) transfer the derivative instruments to an alternative counterparty.

Details of our Derivative Instruments

Cross-currency Derivative Contracts

We generally match the denomination of our subsidiaries' borrowings with the functional currency of the supporting operations or, when it is more cost effective, we provide for an economic hedge against foreign currency exchange rate movements by using derivative instruments to synthetically convert unmatched debt into the applicable underlying currency. At December 31, 2019, substantially all of our debt was either directly or synthetically matched to the applicable functional currencies of the underlying operations. The following table sets forth the total notional amounts and the related weighted average remaining contractual lives of our cross-currency swap contracts at December 31, 2019:

<u>Borrowing group</u>	<u>Notional amount due from counterparty</u>		<u>Notional amount due to counterparty</u>		<u>Weighted average remaining life</u>
	in millions				in years
Virgin Media	\$	10,857.5	£	8,003.6 (a)	5.6
	£	2,296.2	\$	3,300.0 (b)	5.1
	€	246.3	\$	271.1	3.0
UPC Holding	\$	775.0	€	643.1	4.3
	\$	1,200.0	CHF	1,107.5 (a)	5.2
	€	2,824.4	CHF	3,221.2 (a)	4.3
	€	742.8	PLN	3,149.5	1.9
Telenet	\$	3,940.0	€	3,489.6 (a)	6.0
	€	291.5	\$	350.0 (b)	6.0

(a) Includes certain derivative instruments that are “forward-starting,” such that the initial exchange occurs at a date subsequent to December 31, 2019. These instruments are typically entered into in order to extend existing hedges without the need to amend existing contracts.

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- (b) Includes certain derivative instruments that do not involve the exchange of notional amounts at the inception and maturity of the instruments. Accordingly, the only cash flows associated with these derivative instruments are coupon-related payments and receipts. At December 31, 2019, the total U.S. dollar equivalents of the notional amount of these derivative instruments were \$3.4 billion.

Interest Rate Swap Contracts

The following table sets forth the total U.S. dollar equivalents of the notional amounts and the related weighted average remaining contractual lives of our interest rate swap contracts at December 31, 2019:

<u>Borrowing group</u>	<u>Borrowing group pays fixed rate</u>		<u>Borrowing group receives fixed rate</u>	
	<u>Notional amount</u>	<u>Weighted average remaining life</u>	<u>Notional amount</u>	<u>Weighted average remaining life</u>
	in millions	in years	in millions	in years
Virgin Media	\$ 21,715.5 (a)	2.7	\$ 11,542.6 (a)	4.4
UPC Holding	\$ 7,237.1 (a)	3.5	\$ 5,312.1	5.9
Telenet	\$ 3,239.1 (a)	5.2	\$ 1,602.4	3.7

- (a) Includes forward-starting derivative instruments.

Interest Rate Swap Options

We have entered into various interest rate swap options (**swaptions**), which give us the right, but not the obligation, to enter into certain interest rate swap contracts at set dates in the future, with each such contract having a life of no more than three years. At the transaction date, the strike rate of each of these contracts was above the corresponding market rate. The following table sets forth certain information regarding our swaptions at December 31, 2019:

<u>Borrowing group</u>	<u>Notional amount</u>	<u>Underlying swap currency</u>	<u>Weighted average option expiration period (a)</u>	<u>Weighted average strike rate (b)</u>
	in millions		in years	
Virgin Media	\$ 7,085.7	£	1.0	2.40%
	\$ 482.7	€	0.6	1.96%

- (a) Represents the weighted average period until the date on which we have the option to enter into the interest rate swap contracts.
- (b) Represents the weighted average interest rate that we would pay if we exercised our option to enter into the interest rate swap contracts.

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Basis Swaps

Our basis swaps involve the exchange of attributes used to calculate our floating interest rates, including (i) the benchmark rate, (ii) the underlying currency and/or (iii) the borrowing period. We typically enter into these swaps to optimize our interest rate profile based on our current evaluations of yield curves, our risk management policies and other factors. The following table sets forth the total U.S. dollar equivalents of the notional amounts and related weighted average remaining contractual lives of our basis swap contracts at December 31, 2019:

<u>Borrowing group</u>	<u>Notional amount due from counterparty</u> in millions	<u>Weighted average remaining life</u> in years
Virgin Media	\$ 4,493.7	0.5
Telenet	\$ 2,295.0	0.5

Interest Rate Caps, Floors and Collars

From time to time, we enter into interest rate cap, floor and collar agreements. Purchased interest rate caps and collars lock in a maximum interest rate if variable rates rise, but also allow our company to benefit, to a limited extent in the case of collars, from declines in market rates. Purchased interest rate floors protect us from interest rates falling below a certain level, generally to match a floating rate floor on a debt instrument. At December 31, 2019, we had no interest rate collar agreements, and the total U.S. dollar equivalents of the notional amounts of our purchased interest rate caps and floors were \$1,107.4 million and \$1,246.4 million, respectively.

Impact of Derivative Instruments on Borrowing Costs

The impact of the derivative instruments that mitigate our foreign currency and interest rate risk, as described above, on our borrowing costs is as follows:

	<u>Decrease to borrowing costs at December 31, 2019 (a)</u>
Virgin Media	(0.20)%
UPC Holding	(0.15)%
Telenet	(0.58)%
Total decrease to borrowing costs	(0.27)%

(a) Represents the effect of derivative instruments in effect at December 31, 2019 and does not include forward-starting derivative instruments or swaptions.

Foreign Currency Forwards and Options

Certain of our subsidiaries enter into foreign currency forward and option contracts with respect to non-functional currency exposure. As of December 31, 2019, the total U.S. dollar equivalent of the notional amounts of our foreign currency forward and option contracts was \$415.4 million.

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Equity-related Derivative Instruments

ITV Collar and Secured Borrowing. The ITV Collar comprises (i) purchased put options exercisable by our company and (ii) written call options exercisable by the counterparty. The ITV Collar effectively hedges the value of our investment in ITV shares from losses due to market price decreases below the put option price while retaining a portion of the gains from market price increases up to the call option price. The ITV Collar has settlement dates ranging from 2020 to 2022.

The ITV Collar and related agreements also provide our company with the ability to borrow against the value of its ITV shares. At December 31, 2019, borrowings under the ITV Collar Loan were secured by all 398,515,510 of our ITV shares, which have been placed into a custody account. The ITV Collar Loan, which has maturity dates consistent with the ITV Collar and contains no financial covenants, provides for customary representations and warranties, events of default and certain adjustment and termination events. Under the terms of the ITV Collar, the counterparty has the right to re-use the pledged ITV shares held in the custody account, but we have the right to recall the shares that are re-used by the counterparty subject to certain costs. In addition, the counterparty retains dividends on the ITV shares that the counterparty would need to borrow from the custody account to hedge its exposure under the ITV Collar (an estimated 390 million shares at December 31, 2019). As of December 31, 2019, the fair value of the ITV Collar was a net asset of \$619.6 million and principal borrowings outstanding under the ITV Collar Loan were \$1,435.5 million.

Lionsgate Forward and Secured Borrowing. The Lionsgate Forward has economic characteristics similar to a collar plus a loan initially collateralized by a pledge of 1.25 million of our voting and 1.25 million of our non-voting Lionsgate shares (the **Lionsgate Loan**). Under the terms of the Lionsgate Forward, the counterparty does not have the right to re-use the pledged Lionsgate shares without permission from Liberty Global. The Lionsgate Forward effectively hedges the value of our pledged Lionsgate shares from losses due to market price decreases below the put option price while retaining a portion of the gains from market price increases up to the call option price. The Lionsgate Forward has settlement dates through March 2022, the first of which occurred during the third quarter of 2019, as further described below. As of December 31, 2019, the fair value of the Lionsgate Forward was a net asset of \$37.2 million and principal borrowings outstanding under the Lionsgate Loan were \$55.3 million.

During the third quarter of 2019, we cash settled the first 25 tranches of the Lionsgate Forward with respect to certain of our voting and non-voting Lionsgate shares. Subsequent to the settlement of these tranches of the Lionsgate Forward (\$18.1 million asset value on the relevant settlement dates) and the related borrowings under the Lionsgate Loan (\$27.6 million liability on the relevant settlement dates), the shares collateralized under the Lionsgate Loan were reduced to a pledge of 833,333 of our voting and 833,334 of our non-voting Lionsgate shares.

For additional information regarding our investments in ITV and Lionsgate, see note 7.

(9) Fair Value Measurements

We use the fair value method to account for (i) certain of our investments, (ii) our derivative instruments and (iii) certain instruments that we classify as debt. The reported fair values of these investments and instruments as of December 31, 2019 are unlikely to represent the value that will be paid or received upon the ultimate settlement or disposition of these assets and liabilities.

GAAP provides for a fair value hierarchy that prioritizes the inputs to valuation techniques used to measure fair value into three broad levels. Level 1 inputs are quoted market prices in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date. Level 2 inputs are inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for the asset or liability. We record transfers of assets or liabilities into or out of Levels 1, 2 or 3 at the beginning of the quarter during which the transfer occurred. During 2019, no material transfers were made.

All of our Level 2 inputs (interest rate futures, swap rates and certain of the inputs for our weighted average cost of capital calculations) and certain of our Level 3 inputs (forecasted volatilities and credit spreads) are obtained from pricing services. These inputs, or interpolations or extrapolations thereof, are used in our internal models to calculate, among other items, yield curves, forward interest and currency rates and weighted average cost of capital rates. In the normal course of business, we receive market value assessments from the counterparties to our derivative contracts. Although we compare these assessments to our internal valuations and investigate unexpected differences, we do not otherwise rely on counterparty quotes to determine the fair values of our derivative instruments. The midpoints of applicable bid and ask ranges generally are used as inputs for our internal valuations.

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For our investments in publicly-traded companies, the recurring fair value measurements are based on the quoted closing price of the respective shares at each reporting date. Accordingly, the valuations of these investments fall under Level 1 of the fair value hierarchy. Our other investments that we account for at fair value are privately-held companies, and therefore, quoted market prices are unavailable. The valuation technique we use for such investments is a combination of an income approach (discounted cash flow model based on forecasts) and a market approach (market multiples of similar businesses). With the exception of certain inputs for our weighted average cost of capital calculations that are derived from pricing services, the inputs used to value these investments are based on unobservable inputs derived from our assumptions. Therefore, the valuation of our privately-held investments falls under Level 3 of the fair value hierarchy. Any reasonably foreseeable changes in assumed levels of unobservable inputs for the valuations of our Level 3 investments would not be expected to have a material impact on our financial position or results of operations.

The recurring fair value measurement of our equity-related derivative instruments are based on standard option pricing models, which require the input of observable and unobservable variables such as exchange-traded equity prices, risk-free interest rates, dividend forecasts and forecasted volatilities of the underlying equity securities. The valuations of our equity-related derivative instruments are based on a combination of Level 1 inputs (exchange-traded equity prices), Level 2 inputs (interest rate futures and swap rates) and Level 3 inputs (forecasted volatilities). As changes in volatilities could have a significant impact on the overall valuations over the terms of the derivative instruments, we have determined that these valuations fall under Level 3 of the fair value hierarchy. At December 31, 2019, our equity-related derivatives were not significantly impacted by forecasted volatilities.

In order to manage our interest rate and foreign currency exchange risk, we have entered into (i) various derivative instruments and (ii) certain instruments that we classify as debt, as further described in notes 8 and 11, respectively. The recurring fair value measurements of these instruments are determined using discounted cash flow models. With the exception of the inputs for certain swaptions, most of the inputs to these discounted cash flow models consist of, or are derived from, observable Level 2 data for substantially the full term of these instruments. This observable data mostly includes currency rates, interest rate futures and swap rates, which are retrieved or derived from available market data. Although we may extrapolate or interpolate this data, we do not otherwise alter this data in performing our valuations. We use a Monte Carlo based approach to incorporate a credit risk valuation adjustment in our fair value measurements to estimate the impact of both our own nonperformance risk and the nonperformance risk of our counterparties. The inputs used for our credit risk valuations, including our and our counterparties' credit spreads, represent our most significant Level 3 inputs, and these inputs are used to derive the credit risk valuation adjustments with respect to these instruments. As we would not expect these parameters to have a significant impact on the valuations of these instruments, we have determined that these valuations (other than the valuations of the aforementioned swaptions) fall under Level 2 of the fair value hierarchy. Due to the lack of Level 2 inputs for the swaption valuations, we believe these valuations fall under Level 3 of the fair value hierarchy. Our credit risk valuation adjustments with respect to our cross-currency and interest rate swaps are quantified and further explained in note 8.

Fair value measurements are also used in connection with nonrecurring valuations performed in connection with acquisition accounting and impairment assessments. The nonrecurring valuations associated with acquisition accounting primarily include the valuation of reporting units, customer relationship and other intangible assets and property and equipment. Unless a reporting unit has a readily determinable fair value, the valuation of reporting units is based at least in part on discounted cash flow analyses. With the exception of certain inputs for our weighted average cost of capital and discount rate calculations that are derived from pricing services, the inputs used in our discounted cash flow analyses, such as forecasts of future cash flows, are based on our assumptions. The valuation of customer relationships is primarily based on an excess earnings methodology, which is a form of a discounted cash flow analysis. The excess earnings methodology requires us to estimate the specific cash flows expected from the customer relationship, considering such factors as estimated customer life, the revenue expected to be generated over the life of the customer relationship, contributory asset charges and other factors. Tangible assets are typically valued using a replacement or reproduction cost approach, considering factors such as current prices of the same or similar equipment, the age of the equipment and economic obsolescence. Most of our nonrecurring valuations use significant unobservable inputs and therefore fall under Level 3 of the fair value hierarchy. During 2019, we performed a nonrecurring fair value measurement in connection with the De Vijver Media Acquisition. This valuation had no significant impact on our consolidated balance sheet at December 31, 2019. We did not perform any significant nonrecurring fair value measurements during 2018.

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A summary of our assets and liabilities that are measured at fair value on a recurring basis is as follows:

<u>Description</u>	<u>Fair value measurements at December 31, 2019 using:</u>			
	<u>December 31, 2019</u>	<u>Quoted prices in active markets for identical assets (Level 1)</u>	<u>Significant other observable inputs (Level 2)</u>	<u>Significant unobservable inputs (Level 3)</u>
in millions				
Assets:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 1,157.2	\$ —	\$ 1,157.2	\$ —
Equity-related derivative instruments	663.4	—	—	663.4
Foreign currency forward and option contracts	6.0	—	6.0	—
Other	0.9	—	0.9	—
Total derivative instruments	1,827.5	—	1,164.1	663.4
Investments	1,289.2	869.2	—	420.0
Total assets	<u>\$ 3,116.7</u>	<u>\$ 869.2</u>	<u>\$ 1,164.1</u>	<u>\$ 1,083.4</u>
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 1,581.5	\$ —	\$ 1,561.6	\$ 19.9
Foreign currency forward and option contracts	1.2	—	1.2	—
Total derivative liabilities	1,582.7	—	1,562.8	19.9
Debt	45.6	—	45.6	—
Total liabilities	<u>\$ 1,628.3</u>	<u>\$ —</u>	<u>\$ 1,608.4</u>	<u>\$ 19.9</u>

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Description	Fair value measurements at December 31, 2018 using:			
	December 31, 2018	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
in millions				
Assets:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 1,742.8	\$ —	\$ 1,742.5	\$ 0.3
Equity-related derivative instruments	746.3	—	—	746.3
Foreign currency forward and option contracts	7.2	—	7.2	—
Other	0.4	—	0.4	—
Total derivative instruments	2,496.7	—	1,750.1	746.6
Investments	1,174.8	755.9	—	418.9
Total assets	<u>\$ 3,671.5</u>	<u>\$ 755.9</u>	<u>\$ 1,750.1</u>	<u>\$ 1,165.5</u>
Liabilities:				
Derivative instruments:				
Cross-currency and interest rate derivative contracts	\$ 1,368.7	\$ —	\$ 1,354.3	\$ 14.4
Equity-related derivative instruments	1.4	—	—	1.4
Foreign currency forward and option contracts	0.5	—	0.5	—
Other	0.1	—	0.1	—
Total derivative liabilities	1,370.7	—	1,354.9	15.8
Debt	248.6	—	248.6	—
Total liabilities	<u>\$ 1,619.3</u>	<u>\$ —</u>	<u>\$ 1,603.5</u>	<u>\$ 15.8</u>

A reconciliation of the beginning and ending balances of our assets and liabilities measured at fair value on a recurring basis using significant unobservable, or Level 3, inputs is as follows:

	Investments	Cross-currency, interest rate and foreign currency derivative contracts	Equity-related derivative instruments	Total
	in millions			
Balance of net assets (liabilities) at January 1, 2019	\$ 418.9	\$ (14.1)	\$ 744.9	\$ 1,149.7
Gains (losses) included in loss from continuing operations (a):				
Realized and unrealized gains (losses) on derivative instruments, net	—	58.7	(63.4)	(4.7)
Realized and unrealized losses due to changes in fair values of certain investments and debt, net	(16.5)	—	—	(16.5)
Partial settlement of Lionsgate Forward (b)	—	—	(18.1)	(18.1)
Additions	19.6	—	—	19.6
Derivative instruments settled in connection with the sale of the Vodafone Disposal Group				
	—	(72.0)	—	(72.0)
Transfers out of Level 3	—	8.4	—	8.4
Foreign currency translation adjustments and other, net	(2.0)	(0.9)	—	(2.9)
Balance of net assets (liabilities) at December 31, 2019	<u>\$ 420.0</u>	<u>\$ (19.9)</u>	<u>\$ 663.4</u>	<u>\$ 1,063.5</u>

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- (a) With the exception of a \$72.0 million net gain related to derivative instruments settled in connection with the sale of the Vodafone Disposal Group, most of these net gains and losses relate to assets and liabilities that we continue to carry on our consolidated balance sheet as of December 31, 2019.
- (b) For additional information regarding the Lionsgate Forward, see note 8.

(10) Long-lived Assets

Property and Equipment, Net

The details of our property and equipment and the related accumulated depreciation are set forth below:

	Estimated useful life at December 31, 2019	December 31,	
		2019	2018
in millions			
Distribution systems	3 to 30 years	\$ 19,007.2	\$ 17,845.4
Customer premises equipment	3 to 7 years	4,294.7	4,191.2
Support equipment, buildings and land	2 to 50 years	5,344.3	4,933.7
Total property and equipment, gross		28,646.2	26,970.3
Accumulated depreciation		(14,802.8)	(13,091.4)
Total property and equipment, net		<u>\$ 13,843.4</u>	<u>\$ 13,878.9</u>

Depreciation expense related to our property and equipment was \$3,123.5 million, \$3,217.1 million and \$3,187.4 million during 2019, 2018 and 2017, respectively.

During 2019, 2018 and 2017, we recorded non-cash increases to our property and equipment related to vendor financing arrangements of \$1,727.0 million, \$2,175.5 million and \$2,336.2 million, respectively, which exclude related VAT of \$286.1 million, \$347.3 million and \$387.1 million, respectively, that was also financed by our vendors under these arrangements.

Goodwill

Changes in the carrying amount of our goodwill during 2019 are set forth below:

	January 1, 2019	Acquisitions and related adjustments	Foreign currency translation adjustments	December 31, 2019
in millions				
U.K./Ireland	\$ 7,671.0	\$ —	\$ 294.4	\$ 7,965.4
Belgium	2,576.3	48.7	(48.9)	2,576.1
Switzerland	2,903.9	—	49.3	2,953.2
Central and Eastern Europe	564.6	—	(7.2)	557.4
Total	<u>\$ 13,715.8</u>	<u>\$ 48.7</u>	<u>\$ 287.6</u>	<u>\$ 14,052.1</u>

If, among other factors, (i) our equity values were to decline or (ii) the adverse impacts of economic, competitive, regulatory or other factors were to cause our results of operations or cash flows to be worse than anticipated, we could conclude in future periods that impairment charges are required in order to reduce the carrying values of our goodwill and, to a lesser extent, other long-lived assets. Any such impairment charges could be significant.

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Changes in the carrying amount of our goodwill during 2018 are set forth below:

	January 1, 2018	Acquisitions and related adjustments	Foreign currency translation adjustments	December 31, 2018
in millions				
U.K./Ireland	\$ 8,134.1	\$ 2.0	\$ (465.1)	\$ 7,671.0
Belgium	2,681.7	24.9	(130.3)	2,576.3
Switzerland	2,931.3	(0.3)	(27.1)	2,903.9
Central and Eastern Europe	607.0	—	(42.4)	564.6
Total	<u>\$ 14,354.1</u>	<u>\$ 26.6</u>	<u>\$ (664.9)</u>	<u>\$ 13,715.8</u>

Intangible Assets Subject to Amortization, Net

The details of our intangible assets subject to amortization, which are included in other assets, net, on our consolidated balance sheets, are set forth below:

	Estimated useful life at December 31, 2019	December 31, 2019			December 31, 2018		
		Gross carrying amount	Accumulated amortization	Net carrying amount	Gross carrying amount	Accumulated amortization	Net carrying amount
in millions							
Customer relationships	5 to 10 years	\$ 3,653.9	\$ (3,363.6)	\$ 290.3	\$ 3,673.1	\$ (2,914.2)	\$ 758.9
Other	2 to 15 years	563.7	(281.9)	281.8	521.3	(249.0)	272.3
Total		<u>\$ 4,217.6</u>	<u>\$ (3,645.5)</u>	<u>\$ 572.1</u>	<u>\$ 4,194.4</u>	<u>\$ (3,163.2)</u>	<u>\$ 1,031.2</u>

Amortization expense related to intangible assets with finite useful lives was \$528.7 million, \$641.1 million and \$603.2 million during 2019, 2018 and 2017, respectively. Based on our amortizable intangible asset balances at December 31, 2019, we expect that amortization expense will be as follows for the next five years and thereafter. The U.S. dollar equivalents of such amortization expense amounts as of December 31, 2019 are presented below (in millions):

2020	\$ 178.5
2021	88.9
2022	38.3
2023	32.6
2024	32.4
Thereafter	201.4
Total	<u>\$ 572.1</u>

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(11) Debt

The U.S. dollar equivalents of the components of our debt are as follows:

	Weighted average interest rate (a)	December 31, 2019		Principal amount	
		Unused borrowing capacity (b)		December 31,	
		Borrowing currency	U.S. \$ equivalent	2019	2018
in millions					
VM Senior Secured Notes	5.34%	—	\$ —	\$ 5,916.9	\$ 6,268.3
VM Credit Facilities (c)	3.94%	(d)	1,326.3	5,473.3	4,600.5
VM Senior Notes	5.34%	—	—	1,583.8	1,999.9
Telenet Credit Facility	3.89%	(e)	567.0	3,541.4	3,145.7
Telenet Senior Secured Notes	4.69%	—	—	1,673.7	1,687.1
Telenet SPE Notes	—	—	—	—	546.2
UPCB SPE Notes	4.54%	—	—	2,420.1	2,445.5
UPC Holding Bank Facility	—	€ 990.1	1,111.7	—	1,645.0
UPC Holding Senior Notes	4.60%	—	—	1,202.3	1,215.5
Vendor financing (f)	4.12%	—	—	3,748.2	3,620.3
ITV Collar Loan	0.90%	—	—	1,435.5	1,379.6
Derivative-related debt instruments (g)	2.58%	—	—	81.1	301.9
Other (h)	3.96%	—	—	571.8	459.8
Total debt before deferred financing costs, discounts and premiums (i)	4.30%		\$ 3,005.0	\$ 27,648.1	\$ 29,315.3

The following table provides a reconciliation of total debt before deferred financing costs, discounts and premiums to total debt and finance lease obligations:

	December 31,	
	2019	2018
	in millions	
Total debt before deferred financing costs, discounts and premiums	\$ 27,648.1	\$ 29,315.3
Deferred financing costs, discounts and premiums, net	(82.7)	(131.4)
Total carrying amount of debt	27,565.4	29,183.9
Finance lease obligations (note 12)	617.1	621.3
Total debt and finance lease obligations	28,182.5	29,805.2
Current maturities of debt and finance lease obligations	(3,877.2)	(3,615.2)
Long-term debt and finance lease obligations	\$ 24,305.3	\$ 26,190.0

- (a) Represents the weighted average interest rate in effect at December 31, 2019 for all borrowings outstanding pursuant to each debt instrument, including any applicable margin. The interest rates presented represent stated rates and do not include the impact of derivative instruments, deferred financing costs, original issue premiums or discounts and commitment fees, all of which affect our overall cost of borrowing. Including the effects of derivative instruments, original issue premiums or discounts and commitment fees, but excluding the impact of deferred financing costs, our weighted average interest rate on our aggregate variable- and fixed-rate indebtedness was 4.14% at December 31, 2019. For information regarding our derivative instruments, see note 8.

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- (b) Unused borrowing capacity represents the maximum availability under the applicable facility at December 31, 2019 without regard to covenant compliance calculations or other conditions precedent to borrowing. At December 31, 2019, based on the most restrictive applicable leverage covenants, the full amount of unused borrowing capacity was available to be borrowed under each of the respective subsidiary facilities, and based on the most restrictive applicable leverage-based restricted payment tests, there were no restrictions on the respective subsidiary's ability to make loans or distributions from this availability to Liberty Global or its subsidiaries or other equity holders, except as shown in the table below. In the following table, we present (i) for each subsidiary where the ability to borrow is limited, the actual borrowing availability under the respective facility and (ii) for each subsidiary where the ability to make loans or distributions from this availability is limited, the amount that can be loaned or distributed to Liberty Global or its subsidiaries or other equity holders. The amounts presented below reflect any applicable restrictions in effect at December 31, 2019, both before and after completion of the relevant December 31, 2019 compliance reporting requirements, but do not consider any actual or potential changes to our borrowing levels or any amounts loaned or distributed subsequent to December 31, 2019, or the impact of additional amounts that may be available to borrow, loan or distribute under certain defined baskets within each respective facility.

	December 31, 2019		Upon completion of relevant December 31, 2019 compliance reporting requirements	
	Borrowing currency	U.S. \$ equivalent	Borrowing currency	U.S. \$ equivalent
	in millions			
Limitation on availability to be borrowed under (1):				
VM Credit Facilities	£ 533.8	\$ 708.0	£ 921.6	\$ 1,222.3
UPC Holding Bank Facility	€ 990.1	\$ 1,111.7	€ 828.8	\$ 930.6

- (1) The VM Credit Facilities and the UPC Holding Bank Facility have no additional restriction to loan or distribute from this availability.
- (c) Amounts include £103.6 million (\$137.4 million) and £41.9 million (\$55.6 million) at December 31, 2019 and 2018, respectively, of borrowings pursuant to excess cash facilities under the VM Credit Facilities. These borrowings are owed to certain non-consolidated special purpose financing entities that have issued notes to finance the purchase of receivables due from Virgin Media to certain other third parties for amounts that Virgin Media and its subsidiaries have vendor financed. To the extent the proceeds from these notes exceed the amount of vendor financed receivables available to be purchased, the excess proceeds are used to fund these excess cash facilities.
- (d) Unused borrowing capacity under the VM Credit Facilities relates to a multi-currency revolving facility with a maximum borrowing capacity equivalent to £1,000.0 million (\$1,326.3 million) (the **VM Revolving Facility**), which was undrawn at December 31, 2019. During 2019, the VM Revolving Facility was amended and as a result, VM Revolving Facility A and VM Revolving Facility B were cancelled in full and replaced with a single revolving facility maturing on January 31, 2026.
- (e) Unused borrowing capacity under the Telenet Credit Facility comprises (i) €400.0 million (\$449.0 million) under Telenet Facility AG, (ii) €60.0 million (\$67.4 million) under Telenet Facility AP, which was entered into in May 2019, (iii) €25.0 million (\$28.1 million) under the Telenet Overdraft Facility and (iv) €20.0 million (\$22.5 million) under the Telenet Revolving Facility, each of which were undrawn at December 31, 2019.
- (f) Represents amounts owed pursuant to interest-bearing vendor financing arrangements that are used to finance certain of our property and equipment additions and operating expenses. These obligations are generally due within one year and include VAT that was paid on our behalf by the vendor. Repayments of vendor financing obligations are included in repayments and repurchases of debt and finance lease obligations in our consolidated statements of cash flows.
- (g) Includes amounts associated with certain derivative-related borrowing instruments, including \$45.6 million and \$248.6 million at December 31, 2019 and 2018, respectively, carried at fair value. These instruments mature at various dates through January 2025. For information regarding fair value hierarchies, see note 9.

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- (h) As of December 31, 2019 and 2018, amounts include (i) \$264.6 million and \$225.9 million, respectively, of debt collateralized by certain trade receivables of Virgin Media and (ii) \$55.3 million and \$82.9 million, respectively, related to principal borrowings outstanding under the Lionsgate Loan.
- (i) As of December 31, 2019 and 2018, our debt had an estimated fair value of \$28.4 billion and \$28.5 billion, respectively. The estimated fair values of our debt instruments are generally determined using the average of applicable bid and ask prices (mostly Level 1 of the fair value hierarchy) or, when quoted market prices are unavailable or not considered indicative of fair value, discounted cash flow models (mostly Level 2 of the fair value hierarchy). The discount rates used in the cash flow models are based on the market interest rates and estimated credit spreads of the applicable entity, to the extent available, and other relevant factors. For additional information regarding fair value hierarchies, see note 9.

General Information

At December 31, 2019, most of our outstanding debt had been incurred by one of our three subsidiary “borrowing groups.” References to these borrowing groups, which comprise Virgin Media, UPC Holding and Telenet, include their respective restricted parent and subsidiary entities.

Credit Facilities. Each of our borrowing groups has entered into one or more credit facility agreements with certain financial and other institutions. Each of these credit facilities contain certain covenants, the more notable of which are as follows:

- Our credit facilities contain certain consolidated net leverage ratios, as specified in the relevant credit facility, which are required to be complied with (i) on an incurrence basis and/or (ii) when the associated revolving credit facilities have been drawn beyond a specified percentage of the total available revolving credit commitments, on a maintenance basis;
- Subject to certain customary and agreed exceptions, our credit facilities contain certain restrictions which, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to their direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- Our credit facilities require that certain members of the relevant borrowing group guarantee the payment of all sums payable under the relevant credit facility and such group members are required to grant first-ranking security over their shares or, in certain borrowing groups, over substantially all of their assets to secure the payment of all sums payable thereunder;
- In addition to certain mandatory prepayment events, our credit facilities provide that the instructing group of lenders under the relevant credit facility, under certain circumstances, may cancel the group’s commitments thereunder and declare the loan(s) thereunder due and payable after the applicable notice period following the occurrence of a change of control (as specified in the relevant credit facility);
- Our credit facilities contain certain customary events of default, the occurrence of which, subject to certain exceptions, materiality qualifications and cure rights, would allow the instructing group of lenders to (i) cancel the total commitments, (ii) declare that all or part of the loans be payable on demand and/or (iii) accelerate all outstanding loans and terminate their commitments thereunder;
- Our credit facilities require members of the relevant borrowing group to observe certain affirmative and negative undertakings and covenants, which are subject to certain materiality qualifications and other customary and agreed exceptions; and
- In addition to customary default provisions, our credit facilities generally include certain cross-default or cross-acceleration provisions with respect to other indebtedness of members of the relevant borrowing group, subject to agreed minimum thresholds and other customary and agreed exceptions.

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Senior and Senior Secured Notes. Certain of our borrowing groups have issued senior and/or senior secured notes. In general, our senior and senior secured notes (i) are senior obligations of each respective issuer within the relevant borrowing group that rank equally with all of the existing and future senior debt of such issuer and are senior to all existing and future subordinated debt of such issuer within the relevant borrowing group, (ii) contain, in most instances, certain guarantees from other members of the relevant borrowing group (as specified in the applicable indenture) and (iii) with respect to our senior secured notes, are secured by certain pledges or liens over the assets and/or shares of certain members of the relevant borrowing group. In addition, the indentures governing our senior and senior secured notes contain certain covenants, the more notable of which are as follows:

- Our notes contain certain customary incurrence-based covenants. In addition, our notes provide that any failure to pay principal at its stated maturity (after giving effect to any applicable grace period) of, or any acceleration with respect to, other indebtedness of the issuer or certain subsidiaries over agreed minimum thresholds (as specified under the applicable indenture), is an event of default under the respective notes;
- Subject to certain customary and agreed exceptions, our notes contain certain restrictions that, among other things, restrict the ability of the members of the relevant borrowing group to (i) incur or guarantee certain financial indebtedness, (ii) make certain disposals and acquisitions, (iii) create certain security interests over their assets and (iv) make certain restricted payments to its direct and/or indirect parent companies (and indirectly to Liberty Global) through dividends, loans or other distributions;
- If the relevant issuer or certain of its subsidiaries (as specified in the applicable indenture) sell certain assets, such issuer must, subject to certain customary and agreed exceptions, offer to repurchase the applicable notes at par, or if a change of control (as specified in the applicable indenture) occurs, such issuer must offer to repurchase all of the relevant notes at a redemption price of 101%;
- Our senior secured notes contain certain early redemption provisions including the ability to, during each 12-month period commencing on the issue date for such notes until the applicable call date, redeem up to 10% of the principal amount of the notes at a redemption price equal to 103% of the principal amount of the notes to be redeemed plus accrued and unpaid interest; and
- Certain of our notes are non-callable prior to their stated maturity. The remainder of our notes are non-callable prior to their respective call date (as specified under the applicable indenture). At any time prior to the applicable call date, we may redeem some or all of the applicable notes by paying a “make-whole” premium, which is the present value of all remaining scheduled interest payments to the applicable call date using the discount rate as of the redemption date plus a premium (as specified in the applicable indenture). After the applicable call date, we may redeem some or all of these notes at various redemption prices plus accrued interest and additional amounts (as specified in the applicable indenture), if any, to the applicable redemption date.

SPE Notes. From time to time, we create special purpose financing entities (**SPEs**), most of which are 100% owned by third parties, for the primary purpose of facilitating the offering of senior secured notes, which we collectively refer to as the “**SPE Notes**.”

The SPEs used the proceeds from the issuance of SPE Notes to fund term loan facilities under the credit facilities made available to their respective borrowing group (as further described below), each a “**Funded Facility**” and collectively the “**Funded Facilities**.” Each SPE is dependent on payments from the relevant borrowing entity under the applicable Funded Facility in order to service its payment obligations under each respective SPE Note. Each of the Funded Facility term loans creates a variable interest in the respective SPE for which the relevant borrowing entity is the primary beneficiary and are consolidated by the relevant parent entities, including Liberty Global. As a result, the amounts outstanding under the Funded Facilities are eliminated in the respective borrowing group’s and Liberty Global’s consolidated financial statements. At December 31, 2019, we had outstanding SPE Notes issued by entities consolidated by (i) UPC Holding, collectively the “**UPCB SPEs**” and (ii) Telenet, collectively the “**Telenet SPEs**”.

Pursuant to the respective indentures for the SPE Notes (the **SPE Indentures**) and the respective accession agreements for the Funded Facilities, the call provisions, maturity and applicable interest rate for each Funded Facility are the same as those of the related SPE Notes. The SPEs, as lenders under the relevant Funded Facility for the relevant borrowing group, are treated the same as the other lenders under the respective credit facility, with benefits, rights and protections similar to those afforded to the

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other lenders. Through the covenants in the applicable SPE Indentures and the applicable security interests over (i) all of the issued shares of the relevant SPE and (ii) the relevant SPE's rights under the applicable Funded Facility granted to secure the relevant SPE's obligations under the relevant SPE Notes, the holders of the SPE Notes are provided indirectly with the benefits, rights, protections and covenants granted to the SPEs as lenders under the applicable Funded Facility. The SPEs are prohibited from incurring any additional indebtedness, subject to certain exceptions under the SPE Indentures.

The SPE Notes are non-callable prior to their respective call date (as specified under the applicable SPE Indenture). If, however, at any time prior to the applicable SPE Notes call date, all or a portion of the loans under the related Funded Facility are voluntarily prepaid (a **SPE Early Redemption Event**), then the SPE will be required to redeem an aggregate principal amount of its respective SPE Notes equal to the aggregate principal amount of the loans prepaid under the relevant Funded Facility. In general, the redemption price payable will equal 100% of the principal amount of the applicable SPE Notes to be redeemed and a "make-whole" premium, which is the present value of all remaining scheduled interest payments to the applicable SPE Notes call date using the discount rate (as specified in the applicable SPE Indenture) as of the redemption date plus a premium (as specified in the applicable SPE Indenture).

Upon the occurrence of a SPE Early Redemption Event on or after the applicable SPE Notes call date, the SPE will redeem an aggregate principal amount of its respective SPE Notes equal to the principal amount of the related Funded Facility prepaid at a redemption price (expressed as a percentage of the principal amount), plus accrued and unpaid interest and additional amounts (as specified in the applicable SPE Indenture), if any, to the applicable redemption date.

Financing Transactions

Below we provide summary descriptions of certain financing transactions completed during 2019, 2018 and 2017. A portion of our financing transactions may include non-cash borrowings and repayments. During 2019, 2018 and 2017, non-cash borrowings and repayments aggregated \$3,300.2 million, \$2,583.3 million and \$17,104.0 million, respectively.

Virgin Media - 2019 Financing Transactions

In May 2019, Virgin Media issued (i) \$825.0 million principal amount of U.S. dollar-denominated senior secured notes and (ii) £300.0 million (\$397.9 million) principal amount of sterling-denominated senior secured notes. Virgin Media then increased the amounts issued under these notes by issuing an additional (a) \$600.0 million principal amount of U.S. dollar-denominated senior secured notes in July 2019 and (b) £40.0 million (\$53.1 million) principal amount of sterling-denominated senior secured notes in August 2019. The net proceeds from the issuance of these notes were used to redeem (1) \$802.4 million outstanding principal amount of U.S. dollar-denominated senior secured notes under the VM Senior Secured Notes, (2) £534.1 million (\$708.4 million) outstanding principal amount of sterling-denominated senior secured notes under the VM Senior Secured Notes and (3) £300.0 million outstanding principal amount of sterling-denominated senior notes under the VM Senior Notes. In connection with these transactions, Virgin Media recognized a net loss on debt modification and extinguishment of \$77.2 million related to (A) the payment of \$75.8 million of redemption premiums and (B) the write-off of \$1.4 million of unamortized deferred financing costs, discounts and premiums.

In October 2019, Virgin Media (i) entered into a \$3,300.0 million U.S. dollar-denominated term loan facility and a €750.0 million (\$842.1 million) euro-denominated term loan facility and (ii) issued £400.0 million (\$530.5 million) principal amount of sterling-denominated senior secured notes. The net proceeds from these transactions, together with certain other funds, were used to (a) prepay in full the \$3,400.0 million outstanding principal amount on a U.S. dollar-denominated term loan facility under the VM Credit Facilities and (b) redeem in full (1) \$1,000.0 million outstanding principal amount of U.S. dollar-denominated senior secured notes and (2) £300.0 million (\$397.9 million) outstanding principal amount of sterling-denominated senior secured notes, each under the VM Senior Secured Notes. In connection with these transactions, Virgin Media recognized a net loss on debt modification and extinguishment of \$67.4 million related to (A) the payment of \$46.0 million of redemption premiums and (B) the net write-off of \$21.4 million of unamortized deferred financing costs, discounts and premiums.

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Virgin Media - 2018 and 2017 Financing Transactions

During 2018 and 2017, Virgin Media completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, Virgin Media recognized losses on debt modification and extinguishment of \$36.4 million and \$67.5 million during 2018 and 2017, respectively. These losses include (i) the payment of redemption premiums of \$28.2 million and \$32.6 million, respectively, (ii) the write-off of unamortized deferred financing costs and discounts of \$8.2 million and \$40.6 million, respectively, (iii) the write-off of \$7.0 million of unamortized premiums in 2017 and (iv) the payment of third-party costs of \$1.3 million in 2017.

UPC Holding - 2019 Financing Transactions

In August 2019, a portion of the net proceeds from the sale of the Vodafone Disposal Group were used to prepay in full the \$1,645.0 million outstanding principal amount on a U.S. dollar-denominated term loan facility under the UPC Holding Bank Facility. In connection with this transaction, UPC Holding recognized a loss on debt modification and extinguishment of \$15.4 million related to the write-off of unamortized deferred financing costs and discounts.

UPC Holding - 2018 and 2017 Financing Transactions

During 2018 and 2017, UPC Holding completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, UPC Holding recognized losses on debt modification and extinguishment of \$8.9 million and \$112.1 million during 2018 and 2017, respectively. These losses include (i) the write-off of unamortized deferred financing costs and discounts of \$6.9 million and \$27.8 million, respectively, and (ii) the payment of redemption premiums of \$2.0 million and \$84.3 million, respectively.

Telenet - 2019 Financing Transactions

In July 2019, Telenet prepaid €106.0 million (\$119.0 million) of outstanding principal amount on a euro-denominated term loan facility under the Telenet Credit Facility, together with accrued and unpaid interest and the related prepayment premiums, which was owed to the applicable Telenet SPE and, in turn, the Telenet SPE used such proceeds to redeem €106.0 million outstanding principal amount of euro-denominated notes under the Telenet SPE Notes. This transaction was funded using existing cash and the temporary draw-down of a euro-denominated revolving credit facility under the Telenet Credit Facility. In connection with this transaction, Telenet recognized a loss on debt modification and extinguishment of \$4.0 million related to (i) the payment of \$3.6 million of redemption premiums and (ii) the write-off of \$0.4 million of unamortized deferred financing costs and discounts.

In October 2019, Telenet increased its commitments under (i) a U.S. dollar-denominated term loan facility by \$220.0 million and (ii) a euro-denominated term loan facility by €175.0 million (\$196.5 million), each under the Telenet Credit Facility. The net proceeds from these facilities were used to prepay in full the €371.0 million (\$416.6 million) of outstanding principal amount on a euro-denominated term loan facility under the Telenet Credit Facility, together with accrued and unpaid interest and the related prepayment premiums, which was owed to the applicable Telenet SPE and, in turn, the Telenet SPE used such proceeds to redeem in full the €371.0 million outstanding principal amount of euro-denominated notes under the Telenet SPE Notes. In connection with this transaction, Telenet recognized a loss on debt modification and extinguishment of \$50.7 million related to (a) the payment of \$46.8 million of redemption premiums and (b) the write-off of \$3.9 million of unamortized deferred financing costs and discounts.

Telenet - 2018 and 2017 Financing Transactions

During 2018 and 2017, Telenet completed a number of financing transactions that generally resulted in lower interest rates and extended maturities. In connection with these transactions, Telenet recognized losses on debt modification and extinguishment of \$31.5 million and \$75.7 million during 2018 and 2017, respectively. These losses include (i) the payment of redemption premiums of \$19.3 million and \$21.5 million, respectively, and (ii) the write-off of unamortized deferred financing costs and discounts of \$12.2 million and \$54.2 million, respectively.

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Maturities of Debt

Maturities of our debt as of December 31, 2019 are presented below for the named entity and its subsidiaries, unless otherwise noted. Amounts represent U.S. dollar equivalents based on December 31, 2019 exchange rates:

	Virgin Media	UPC Holding (a)	Telenet (b)	Other	Total
	in millions				
Year ending December 31:					
2020	\$ 2,472.4	\$ 644.6	\$ 415.1	\$ 264.8	\$ 3,796.9
2021 (c)	726.2	22.7	13.2	1,029.2	1,791.3
2022	253.7	20.1	12.6	366.4	652.8
2023	125.4	17.5	12.2	29.3	184.4
2024	779.6	7.7	12.1	—	799.4
Thereafter	11,497.6	3,622.4	5,303.3	—	20,423.3
Total debt maturities (d)	15,854.9	4,335.0	5,768.5	1,689.7	27,648.1
Deferred financing costs, discounts and premiums, net	(23.2)	(20.3)	(27.1)	(12.1)	(82.7)
Total debt	\$ 15,831.7	\$ 4,314.7	\$ 5,741.4	\$ 1,677.6	\$ 27,565.4
Current portion	\$ 2,472.4	\$ 644.6	\$ 415.1	\$ 263.6	\$ 3,795.7
Noncurrent portion	\$ 13,359.3	\$ 3,670.1	\$ 5,326.3	\$ 1,414.0	\$ 23,769.7

- (a) Amounts include the UPCB SPE Notes issued by the UPCB SPEs. As described above, the UPCB SPEs are consolidated by UPC Holding and Liberty Global.
- (b) Amounts include the Telenet SPE Notes issued by the Telenet SPEs. As described above, the Telenet SPEs are consolidated by Telenet and Liberty Global.
- (c) The amount for Virgin Media includes certain senior secured notes that have a contractual maturity date of January 15, 2025. Interest on these senior secured notes accrues at a rate of 6.0% through January 15, 2021 and at a rate of 1.0% thereafter. In light of these terms, the above maturity table assumes that these senior secured notes will be repaid or refinanced in 2021.
- (d) Amounts include vendor financing obligations of \$3,748.2 million, as set forth below:

	Virgin Media	UPC Holding	Telenet	Other	Total
	in millions				
Year ending December 31:					
2020	\$ 2,337.8	\$ 644.6	\$ 402.9	\$ 68.9	\$ 3,454.2
2021	34.8	22.7	—	53.5	111.0
2022	24.6	20.1	—	47.2	91.9
2023	22.1	17.5	—	29.3	68.9
2024	14.5	7.7	—	—	22.2
Total vendor financing maturities	\$ 2,433.8	\$ 712.6	\$ 402.9	\$ 198.9	\$ 3,748.2
Current portion	\$ 2,337.8	\$ 644.6	\$ 402.9	\$ 68.9	\$ 3,454.2
Noncurrent portion	\$ 96.0	\$ 68.0	\$ —	\$ 130.0	\$ 294.0

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(12) Leases

General

We enter into operating and finance leases for network equipment, real estate, mobile site sharing and vehicles. We provide residual value guarantees on certain of our vehicle leases.

Lease Balances

A summary of our ROU assets and lease liabilities as of December 31, 2019 is set forth below:

	ROU assets	Lease liabilities
	in millions	
Finance leases (a)(b)	\$ 531.0	\$ 617.1
Operating leases (c)(d)	512.7	545.1
Total	\$ 1,043.7	\$ 1,162.2

- (a) Our finance lease ROU assets are included in property and equipment, net, on our consolidated balance sheet. At December 31, 2019, the weighted average remaining lease term for finance leases was 23.8 years and the weighted average discount rate was 6.1%. As of December 31, 2018, we had \$545.5 million of finance lease ROU assets included on our consolidated balance sheet. During 2019, 2018 and 2017, we recorded additions to our ROU assets associated with finance leases of \$66.9 million, \$102.4 million and \$106.7 million, respectively.
- (b) The current and long-term portions of our finance lease liabilities are included within current portion of debt and finance lease liabilities and long-term debt and finance lease liabilities, respectively, on our consolidated balance sheets. As of December 31, 2018, we had \$621.3 million of finance lease liabilities included on our consolidated balance sheet. At December 31, 2019 and 2018, our finance lease liabilities included €403.6 million (\$453.2 million) and €390.6 million (\$447.3 million), respectively, associated with Telenet's lease of the broadband communications network of the four associations of municipalities in Belgium, which we refer to as the pure intercommunalities or the "PICs." All capital expenditures associated with the PICs network are initiated by Telenet, but are executed and financed by the PICs through additions to this lease that are repaid over a 15-year term. These amounts do not include Telenet's commitment related to certain operating costs associated with the PICs network. For additional information regarding this commitment, see note 19.
- (c) Our operating lease ROU assets are included in other assets, net, on our consolidated balance sheet. At December 31, 2019, the weighted average remaining lease term for operating leases was 8.0 years and the weighted average discount rate was 4.0%. During 2019, we recorded additions to our ROU assets associated with operating leases of \$88.5 million.
- (d) The current and long-term portions of our operating lease liabilities are included within other accrued and current liabilities and other long-term liabilities, respectively, on our consolidated balance sheet.

A summary of our aggregate lease expense recorded during 2019 is set forth below (in millions):

Finance lease expense:	
Depreciation and amortization	\$ 84.2
Interest expense	33.8
Total finance lease expense	118.0
Operating lease expense (a)	135.7
Short-term lease expense (a)	8.0
Variable lease expense (b)	4.8
Total lease expense	\$ 266.5

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- (a) Our operating lease expense and short-term lease expense are included in other operating expenses, SG&A expenses and impairment, restructuring and other operating items in our consolidated statements of operations.
- (b) Variable lease expense represents payments made to a lessor during the lease term that vary because of a change in circumstance that occurred after the lease commencement date. Variable lease payments are expensed as incurred and are included in other operating expenses in our consolidated statements of operations.

A summary of our cash outflows from operating and finance leases recorded during 2019 is set forth below (in millions):

Cash paid for amounts included in the measurement of lease liabilities:	
Operating cash outflows from operating leases	\$ 135.5
Operating cash outflows from finance leases	33.8
Financing cash outflows from finance leases	60.0
Total cash outflows from operating and finance leases	\$ 229.3

Maturities of our operating and finance lease liabilities as of December 31, 2019 are presented below. Amounts represent U.S. dollar equivalents based on December 31, 2019 exchange rates:

	Operating leases		Finance leases	
	in millions			
Year ending December 31:				
2020	\$	126.6	\$	122.2
2021		98.1		102.6
2022		81.0		101.0
2023		68.5		98.7
2024		56.7		56.4
Thereafter		203.6		459.4
Total payments		634.5		940.3
Less: present value discount		(89.4)		(323.2)
Present value of lease payments	\$	545.1	\$	617.1
Current portion	\$	111.7	\$	81.5
Noncurrent portion	\$	433.4	\$	535.6

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Maturities of our operating and finance lease liabilities as of December 31, 2018 are presented below. Amounts represent U.S. dollar equivalents based on December 31, 2018 exchange rates:

	<u>Operating leases</u>	<u>Finance leases</u>
	<u>in millions</u>	
Year ending December 31:		
2019	\$ 123.9	\$ 101.4
2020	85.4	107.3
2021	66.6	96.7
2022	54.3	94.5
2023	46.8	93.5
Thereafter	178.6	464.0
Total payments	<u>\$ 555.6</u>	<u>957.4</u>
Amounts representing interest		(336.1)
Total finance leases		<u>\$ 621.3</u>
Current portion		<u>\$ 78.2</u>
Noncurrent portion		<u>\$ 543.1</u>

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(13) Income Taxes

Liberty Global files its primary income tax return in the U.K. Its subsidiaries file income tax returns in the U.S., the U.K. and a number of other European jurisdictions. The income taxes of Liberty Global and its subsidiaries are presented on a separate return basis for each tax-paying entity or group.

The components of our earnings (loss) from continuing operations before income taxes are as follows:

	Year ended December 31,		
	2019	2018	2017
	in millions		
U.K.	\$ (831.0)	\$ 330.9	\$ (991.3)
The Netherlands	(662.8) —	(321.1) —	(26.1)
Belgium	409.3	392.4	140.0
Switzerland	178.5	318.8	111.6
U.S.	(7.0)	(51.6)	(842.5)
Intercompany activity with discontinued operations	(237.2)	(426.4)	(499.9)
Other	(5.8)	(81.2)	(2.9)
Total	\$ (1,156.0)	\$ 161.8	\$ (2,111.1)

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Income tax expense consists of:

	<u>Current</u>	<u>Deferred</u>	<u>Total</u>
	in millions		
Year ended December 31, 2019:			
The Netherlands	\$ —	\$ (275.3)	\$ (275.3)
Belgium	(134.7)	3.6	(131.1)
U.K.	(1.5)	118.8	117.3
U.S. (a)	(4.1)	81.9	77.8
Switzerland	(27.8)	(1.1)	(28.9)
Other	(19.4)	6.6	(12.8)
Total	<u>\$ (187.5)</u>	<u>\$ (65.5)</u>	<u>\$ (253.0)</u>
Year ended December 31, 2018:			
U.S. (a)	\$ (957.5)	\$ 7.6	\$ (949.9)
The Netherlands	14.2	(519.4)	(505.2)
Belgium	(153.9)	41.6	(112.3)
U.K.	(7.2)	32.2	25.0
Switzerland	(16.6)	6.2	(10.4)
Other	(14.2)	(6.3)	(20.5)
Total	<u>\$ (1,135.2)</u>	<u>\$ (438.1)</u>	<u>\$ (1,573.3)</u>
Year ended December 31, 2017:			
The Netherlands	\$ (16.2)	\$ (118.2)	\$ (134.4)
U.K.	(3.3)	(64.7)	(68.0)
Belgium	(203.6)	145.4	(58.2)
U.S. (a)	47.2	(32.8)	14.4
Switzerland	(2.0)	15.6	13.6
Other	(14.4)	8.1	(6.3)
Total	<u>\$ (192.3)</u>	<u>\$ (46.6)</u>	<u>\$ (238.9)</u>

(a) Includes federal and state income taxes. Our U.S. state income taxes were not material during any of the years presented.

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Income tax expense attributable to our earnings (loss) from continuing operations before income taxes differs from the amounts computed using the applicable income tax rate as a result of the following factors:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Computed “expected” tax benefit (expense) (a)	\$ 219.6	\$ (30.7)	\$ 406.4
Non-deductible or non-taxable interest and other expenses	(191.7)	(153.8)	(42.8)
Basis and other differences in the treatment of items associated with investments in subsidiaries and affiliates (b)	(167.9)	(360.1)	(192.6)
Change in valuation allowances	(113.6)	(34.9)	(341.6)
Non-deductible or non-taxable foreign currency exchange results	(26.5)	132.5	(233.8)
Enacted tax law and rate changes (c)	19.2	(13.5)	7.4
International rate differences (d)	8.5	(3.5)	126.9
Recognition of previously unrecognized tax benefits	5.9	49.6	4.9
Mandatory Repatriation Tax (e)	—	(1,137.2)	—
Tax benefit associated with technologies innovation	—	—	12.1
Other, net	(6.5)	(21.7)	14.2
Total income tax expense	<u>\$ (253.0)</u>	<u>\$ (1,573.3)</u>	<u>\$ (238.9)</u>

- (a) The statutory or “expected” tax rates are the U.K. rates of 19.0% for 2019, 19.0% for 2018 and 19.25% for 2017. The 2017 statutory rate represents the blended rate that was in effect for the year ended December 31, 2017 based on the 20.0% statutory rate that was in effect for the first quarter of 2017 and the 19.0% statutory rate that was in effect for the remainder of 2017.
- (b) These amounts reflect the net impact of differences in the treatment of income and loss items between financial reporting and tax accounting related to investments in subsidiaries and affiliates including the effects of foreign earnings.
- (c) On December 27, 2019, updated legislation was enacted in the Netherlands to delay and lessen the corporate income tax rate reduction that had previously been enacted in December 2018. The current rate of 25% will now be maintained in 2020 and will be reduced to 21.7% in 2021; the previous reduction schedule reduced from the current rate of 25.0% to 22.5% in 2020 and 20.5% in 2021. Substantially all of the impacts of the new rate change in the Netherlands on our deferred tax balances were recorded during the fourth quarter of 2019, modifying the impacts of the 2018 rate change that were previously recorded during the fourth quarter of 2018. In 2017, a Belgian income tax rate reduction was signed into law. The Belgian statutory tax rate decreased from 33.9% to 29.58% beginning in 2018, and in 2020, this rate will further decrease to 25.0%. Also in 2017, the U.S. corporate income tax rate was reduced from 35.0% to 21.0% effective beginning in 2018. Substantially all of the impacts of the tax rate changes in Belgium and the U.S. on our deferred tax balances were recorded during the fourth quarter of 2017.
- (d) Amounts reflect adjustments (either a benefit or expense) to the “expected” tax benefit (expense) for statutory rates in jurisdictions in which we operate outside of the U.K.
- (e) As further discussed below, the liability we have recorded for the Mandatory Repatriation Tax (as defined and described below) is significantly lower than the amount included in our income tax expense due in part to the expected use of carryforward attributes in the U.S., all of which were subject to valuation allowances prior to the initial recognition of the Mandatory Repatriation Tax during the first quarter of 2018.

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The components of our net deferred tax assets are as follows:

	December 31,	
	2019	2018
in millions		
Deferred tax assets	\$ 2,457.4	\$ 2,488.2
Deferred tax liabilities (a)	(246.4)	(232.9)
Net deferred tax asset	<u>\$ 2,211.0</u>	<u>\$ 2,255.3</u>

- (a) Our deferred tax liabilities are included in other long-term liabilities on our consolidated balance sheets.

The tax effects of temporary differences that give rise to significant portions of the deferred tax assets and deferred tax liabilities are presented below:

	December 31,	
	2019	2018
in millions		
Deferred tax assets:		
Net operating loss and other carryforwards	\$ 4,367.5	\$ 4,289.8
Property and equipment, net	1,969.0	1,923.4
Debt	231.5	317.3
Investments	136.4	156.2
Derivative instruments	113.3	72.5
Share-based compensation	76.5	79.5
Leases	58.5	5.6
Other future deductible amounts	132.3	176.1
Deferred tax assets	7,085.0	7,020.4
Valuation allowance	(4,235.5)	(4,094.7)
Deferred tax assets, net of valuation allowance	<u>2,849.5</u>	<u>2,925.7</u>
Deferred tax liabilities:		
Property and equipment, net	(169.9)	(167.4)
Deferred revenue	(168.1)	(178.9)
Intangible assets	(114.1)	(193.8)
Debt	(65.7)	(91.0)
Right of use assets	(56.8)	—
Other future taxable amounts	(63.9)	(39.3)
Deferred tax liabilities	(638.5)	(670.4)
Net deferred tax asset	<u>\$ 2,211.0</u>	<u>\$ 2,255.3</u>

Our deferred income tax valuation allowance increased \$140.8 million in 2019. This increase reflects the net effect of (i) net tax expense of \$113.6 million, (ii) an increase in deferred tax assets, (iii) foreign currency translation adjustments, (iv) the effect of enacted tax law and rate changes, (v) expiration of net operating losses and (vi) other individually insignificant items.

Virgin Media had property and equipment on which future U.K. tax deductions can be claimed of \$18.4 billion and \$18.1 billion at December 31, 2019 and 2018, respectively. The maximum amount of these “capital allowances” that can be claimed in any one year is approximately 18% of the remaining balance, after additions, disposals and prior claims. The tax effects of the excess of these capital allowances over the related financial reporting bases are included in the 2019 and 2018 deferred tax assets related to property and equipment, net, in the above table.

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The significant components of our tax loss carryforwards and related tax assets at December 31, 2019 are as follows:

Country	Tax loss carryforward	Related tax asset	Expiration date
in millions			
U.K.:			
Amount attributable to capital losses	\$ 16,052.0	\$ 2,728.8	Indefinite
Amount attributable to net operating losses	1,222.4	207.8	Indefinite
The Netherlands	3,204.0	696.2	2020-2025
Belgium	1,320.4	330.1	Indefinite
Ireland	713.8	89.4	Indefinite
Luxembourg	586.4	159.4	Indefinite
France	533.3	137.8	Indefinite
Other	416.8	18.0	Various
Total	\$ 24,049.1	\$ 4,367.5	

Our tax loss carryforwards within each jurisdiction combine all companies' tax losses (both capital and ordinary losses) in that jurisdiction, however, certain tax jurisdictions limit the ability to offset taxable income of a separate company or different tax group with the tax losses associated with another separate company or group. Further, tax jurisdictions restrict the type of taxable income that the above losses are able to offset. The majority of the tax losses shown in the above table are not expected to be realized, including certain losses that are limited in use due to change in control or same business tests.

We have taxable outside basis differences on certain investments in non-U.S. subsidiaries. No additional income taxes have been provided for any undistributed foreign earnings, or any additional outside basis difference inherent in these entities, as these amounts continue to be reinvested in foreign operations. Determination of the amount of any applicable deferred taxes on such outside basis difference is not practicable.

Through our subsidiaries, we maintain a presence in many countries. Many of these countries maintain highly complex tax regimes that differ significantly from the system of income taxation used in the U.K. and the U.S. We have accounted for the effect of these taxes based on what we believe is reasonably expected to apply to us and our subsidiaries based on tax laws currently in effect and reasonable interpretations of these laws.

The Tax Cuts and Jobs Act (the **2017 U.S. Tax Act**) was signed into U.S. law on December 22, 2017. Significant changes to the U.S. income tax regime include the imposition of taxes on a one-time deemed mandatory repatriation of earnings and profits of foreign corporations (the **Mandatory Repatriation Tax**) and a new tax on global intangible low-taxed income (the **GILTI Tax**).

The Mandatory Repatriation Tax requires that the aggregate post-1986 earnings and profits of our foreign corporations be included in our U.S. taxable income. The one-time repatriation of undistributed foreign earnings and profits is then taxed at a rate of 15.5% for cash earnings and 8% for non-cash earnings, both as defined in the 2017 U.S. Tax Act, and is payable, interest free, over an eight year period according to a prescribed payment schedule with 45% of the tax due in the last two years. At December 31, 2019 and 2018, after considering the expected use of carryforward tax attributes and other filing positions, our liability for the Mandatory Repatriation Tax was \$357.2 million and \$293.3 million, respectively. This increase during 2019 is due to the net impact of (i) a settlement with tax authorities that reduced the expected use of certain carryforward tax attributes and (ii) the impact of payments made according to the prescribed payment schedule.

The GILTI Tax will require our U.S. subsidiaries that are shareholders in foreign corporations to include in their taxable income for each year beginning after December 31, 2017, their pro rata share of global intangible low-taxed income. The GILTI Tax is calculated as the excess of the net foreign corporation income over a deemed return. The GILTI Tax is reported as a period cost when it is incurred.

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We and our subsidiaries file consolidated and standalone income tax returns in various jurisdictions. In the normal course of business, our income tax filings are subject to review by various taxing authorities. In connection with such reviews, disputes could arise with the taxing authorities over the interpretation or application of certain income tax rules related to our business in that tax jurisdiction. Such disputes may result in future tax and interest and penalty assessments by these taxing authorities. The ultimate resolution of tax contingencies will take place upon the earlier of (i) the settlement date with the applicable taxing authorities in either cash or agreement of income tax positions or (ii) the date when the tax authorities are statutorily prohibited from adjusting the company's tax computations.

In general, tax returns filed by our company or our subsidiaries for years prior to 2009 are no longer subject to examination by tax authorities. Certain of our subsidiaries are currently involved in income tax examinations in various jurisdictions in which we operate, including the Netherlands, Poland, the U.K. and the U.S. While we do not expect adjustments from the foregoing examinations to have a material impact on our consolidated financial position, results of operations or cash flows, no assurance can be given that this will be the case given the amounts involved and the complex nature of the related issues.

The changes in our unrecognized tax benefits are summarized below:

	2019	2018	2017
	in millions		
Balance at January 1	\$ 857.8	\$ 350.4	\$ 217.0
Settlements with tax authorities	(111.3)	—	(3.6)
Reductions for tax positions of prior years	(80.7)	(117.9)	(20.4)
Foreign currency translation	(4.3)	(8.5)	14.1
Additions based on tax positions related to the current year	1.8	180.0	4.5
Additions for tax positions of prior years	1.0	457.4	138.8
Lapse of statute of limitations	—	(3.6)	—
Balance at December 31	<u>\$ 664.3</u>	<u>\$ 857.8</u>	<u>\$ 350.4</u>

No assurance can be given that any of these tax benefits will be recognized or realized.

As of December 31, 2019, 2018 and 2017, there are \$546.5 million, \$759.8 million, and \$189.3 million of unrecognized tax benefits that would have a favorable impact on our effective income tax rate if ultimately recognized, after considering amounts that we would expect to be offset by valuation allowances and other factors.

During 2020, it is reasonably possible that the resolution of ongoing examinations by tax authorities, as well as the expiration of statutes of limitation and other items, could result in reductions to our unrecognized tax benefits related to tax positions taken as of December 31, 2019. The amount of any such reductions could range up to \$285.0 million, of which substantially all would have a positive impact on our effective tax rate. Other than the potential impacts of these ongoing examinations and the expected expiration of certain statutes of limitation, we do not expect any material changes to our unrecognized tax benefits during 2020. No assurance can be given as to the nature or impact of any changes in our unrecognized tax positions during 2020.

During 2019, 2018 and 2017, the income tax expense of our continuing operations includes net income tax expense of \$22.6 million, \$58.9 million and \$5.5 million, respectively, representing the net accrual of interest and penalties during the period. Our other long-term liabilities include accrued interest and penalties of \$115.1 million at December 31, 2019.

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(14) Equity

Capitalization

At December 31, 2019, our authorized share capital consisted of an aggregate nominal amount of \$20.0 million, consisting of any of the following: (i) ordinary shares (Class A, B or C), each with a nominal value of \$0.01 per share, (ii) preference shares, with a nominal value to be determined by the board of directors, the issuance of one or more classes or series of which may be authorized by the board of directors, and (iii) any other shares of one or more classes as may be determined by the board of directors or by the shareholders of Liberty Global. For the period beginning July 1, 2015 through the December 29, 2017 completion of the Split-off Transaction, our share capital included (a) our Class A, Class B and Class C Liberty Global ordinary shares (collectively referred to herein as “**Liberty Global Shares**”) and (b) our LiLAC Class A, Class B and Class C ordinary shares (collectively referred to herein as “**LiLAC Shares**”). The LiLAC Shares were tracking shares intended to track the economic performance of the LiLAC Group. Pursuant to the Split-off Transaction, the LiLAC Shares were redesignated as deferred shares (which had virtually no economic rights), transferred to a third party and cancelled.

Under Liberty Global’s Articles of Association, effective July 1, 2015, holders of Liberty Global Class A ordinary shares are entitled to one vote for each such share held, and holders of Liberty Global Class B ordinary shares are entitled to 10 votes for each such share held, on all matters submitted to a vote of Liberty Global shareholders at any general meeting (annual or special). Holders of Liberty Global Class C ordinary shares are not entitled to any voting powers except as required by law.

At the option of the holder, each Liberty Global Class B ordinary share is convertible into one Liberty Global Class A ordinary share. One Liberty Global Class A ordinary share is reserved for issuance for each Liberty Global Class B ordinary share that is issued (12,151,526 shares issued as of December 31, 2019). Additionally, at December 31, 2019, we have reserved the following ordinary shares for the issuance of outstanding share-based compensation awards:

	Class A (a)	Class B	Class C (a)
Options	588,258	—	3,506,568
SARs	16,251,617	—	35,682,862
RSUs	515,496	48,786	1,026,010
PSUs and PSARS	7,459,987	1,330,000	14,919,280

(a) Includes share-based compensation awards held by former employees of Liberty Global that (i) became employees of Liberty Latin America as a result of the Split-off Transaction or (ii) were employees of entities included in the Vodafone Disposal Group. For additional information, see note 15.

Subject to any preferential rights of any outstanding class of our preference shares, the holders of our ordinary shares are entitled to dividends as may be declared from time to time by our board of directors from funds available therefore. Except with respect to share distributions, whenever a dividend is paid in cash to the holder of one class of our ordinary shares, we shall also pay to the holders of the other classes of our ordinary shares an equal per share dividend. There are currently no contractual restrictions on our ability to pay dividends in cash or shares.

In the event of our liquidation, dissolution and winding up, after payment or provision for payment of our debts and liabilities and subject to the prior payment in full of any preferential amounts to which our preference shareholders, if any, may be entitled, the holders of our ordinary shares will be entitled to receive their proportionate interests, expressed in liquidation units, in any assets available for distribution to our ordinary shares.

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A summary of the changes in our share capital during 2017 is set forth in the table below:

	Liberty Global Shares				LiLAC Shares (a)			
	Class A	Class B	Class C	Total	Class A	Class B	Class C	Total
in millions								
Balance at January 1, 2017	\$ 2.5	\$ 0.1	\$ 6.3	\$ 8.9	\$ 0.5	\$ —	\$ 1.2	\$ 1.7
Impact of the Split-off Transaction	—	—	—	—	(0.5)	—	(1.2)	(1.7)
Repurchase and cancellation of Liberty Global Shares	(0.3)	—	(0.5)	(0.8)	—	—	—	—
Balance at December 31, 2017	\$ 2.2	\$ 0.1	\$ 5.8	\$ 8.1	\$ —	\$ —	\$ —	\$ —

(a) In connection with the Split-off Transaction, the LiLAC Shares were redesignated as deferred shares (with virtually no economic rights), transferred to a third party and cancelled. For additional information regarding the Split-off Transaction, see note 6.

Share Repurchase Programs

As a U.K. incorporated company, we may only elect to repurchase shares or pay dividends to the extent of our **“Distributable Reserves.”** Distributable Reserves, which are not linked to a GAAP reported amount, may be created through the earnings of the U.K. parent company and, among other methods, through a reduction in share premium approved by the English Companies Court. Based on the amounts set forth in our 2018 U.K. Companies Act Report dated April 25, 2019, which are our most recent “Relevant Accounts” for the purposes of determining our Distributable Reserves under U.K. law, our Distributable Reserves were \$20.7 billion as of December 31, 2018. This amount does not reflect earnings, share repurchases or other activity that occurred in 2019, each of which impacts the amount of our Distributable Reserves.

Our board of directors has approved share repurchase programs for our Liberty Global Shares. In addition, from November 2016 through the completion of the Split-off Transaction, we were authorized to repurchase our LiLAC Shares. Under these plans, we receive authorization to acquire up to the specified amount (before direct acquisition costs) of Class A and Class C Liberty Global Shares or LiLAC Shares, or other authorized securities, from time to time through open market or privately negotiated transactions, which may include derivative transactions. The timing of the repurchase of shares or other securities pursuant to our equity repurchase programs, which may be suspended or discontinued at any time, is dependent on a variety of factors, including market conditions. At December 31, 2019, the remaining amount authorized for share repurchases was \$66.4 million. In February 2020, our board of directors authorized an additional \$1.0 billion for share repurchases.

The following table provides details of our share repurchases during 2019, 2018 and 2017:

	Class A ordinary shares		Class C ordinary shares		Total cost (a)
	Shares repurchased	Average price paid per share (a)	Shares repurchased	Average price paid per share (a)	
in millions					
Liberty Global Shares:					
2019 (b)	24,348,562	\$ 27.61	95,395,291	\$ 26.64	\$ 3,220.2
2018	15,649,900	\$ 29.67	54,211,059	\$ 28.51	\$ 2,010.0
2017	34,881,510	\$ 33.73	52,523,651	\$ 32.71	\$ 2,894.7
LiLAC Shares:					
2017	2,062,233	\$ 22.84	285,572	\$ 22.25	\$ 53.5

(a) Includes direct acquisition costs, where applicable.

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- (b) Includes repurchases made pursuant to modified Dutch auction cash tenders, comprising 24,002,262 shares of our class A ordinary shares at a per share price of \$27.50 and 75,420,009 shares of our class C ordinary shares at a price per share of \$27.00, for an aggregate purchase price of \$2.7 billion, including direct acquisition costs.

Subsidiary Distributions

From time to time, Telenet and certain other of our subsidiaries make cash distributions to their respective shareholders. Our share of these distributions is eliminated in consolidation and the noncontrolling interest owners' share of these distributions is reflected as a charge against noncontrolling interests in our consolidated statements of equity. In this regard, Telenet paid dividends to its shareholders during the fourth quarters of 2019 and 2018 of €62.8 million and €600.0 million, respectively. Our share of these dividends was €37.8 million (\$42.0 million at the applicable rate) and €351.6 million (\$404.8 million at the applicable rate), respectively.

Restricted Net Assets

The ability of certain of our subsidiaries to distribute or loan all or a portion of their net assets to our company is limited by the terms of applicable debt facilities. At December 31, 2019, substantially all of our net assets represented net assets of our subsidiaries that were subject to such limitations.

(15) Share-based Compensation

Our share-based compensation expense primarily relates to the share-based incentive awards issued by Liberty Global to its employees and employees of its subsidiaries. A summary of our aggregate share-based compensation expense is set forth below:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Liberty Global:			
Performance-based incentive awards (a)	\$ 134.5	\$ 50.8	\$ 23.9
Non-performance based incentive awards (b)	107.6	90.1	93.8
Other (c)	39.0	43.4	13.7
Total Liberty Global	281.1	184.3	131.4
Telenet share-based incentive awards (d)	15.6	19.6	20.7
Other	9.1	2.1	10.1
Total	\$ 305.8	\$ 206.0	\$ 162.2
Included in:			
Other operating expenses	\$ 3.9	\$ 4.4	\$ 4.7
SG&A expenses	301.9	201.6	157.5
Total	\$ 305.8	\$ 206.0	\$ 162.2

- (a) Includes share-based compensation expense related to (i) PSUs, (ii) in 2019, (a) the 2019 Challenge Performance Awards and (b) the performance-based portion of the 2019 CEO Performance Award, each as defined and described below, and (iii) through March 2017, certain performance grant units issued to our Chief Executive Officer.
- (b) The 2019 amount includes share-based compensation expense related to the RSAs issued under the 2019 CEO Performance Award, as defined and described below.
- (c) Represents annual incentive compensation and defined contribution plan liabilities that have been or are expected to be settled with Liberty Global ordinary shares. In the case of the annual incentive compensation, shares have been or will be issued to senior management and key employees pursuant to a shareholding incentive program that was implemented in the fourth quarter of 2017. The shareholding incentive program allows these employees to elect to receive up to 100% of their annual incentive compensation in ordinary shares of Liberty Global in lieu of cash.

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- (d) Represents the share-based compensation expense associated with Telenet's share-based incentive awards, which, at December 31, 2019, included performance- and non-performance-based stock option awards with respect to 3,846,649 Telenet shares. These stock option awards had a weighted average exercise price of €43.82 (\$49.20).

As of December 31, 2019, \$291.8 million of total unrecognized compensation cost related to our Liberty Global share-based compensation awards is expected to be recognized by our company over a weighted-average period of approximately 2.1 years.

The following table summarizes certain information related to the share-based incentive awards granted and exercised with respect to Liberty Global ordinary shares (includes amounts related to awards held by employees of our discontinued operations, unless otherwise noted):

	Year ended December 31,		
	2019	2018	2017
Assumptions used to estimate fair value of options, SARs and PSARs granted:			
Risk-free interest rate	1.59 - 2.45%	2.68 - 2.92%	1.66 - 2.16%
Expected life	3.2 - 6.2 years	3.0 - 4.2 years	3.0 - 6.4 years
Expected volatility	29.9 - 33.8%	30.2 - 33.6%	25.9 - 37.9%
Expected dividend yield	none	none	none
Weighted average grant-date fair value per share of awards granted:			
Options	\$ 8.60	\$ 8.99	\$ 9.40
SARs	\$ 6.79	\$ 7.92	\$ 8.60
PSARs	\$ 6.92	\$ —	\$ —
RSUs	\$ 24.66	\$ 28.72	\$ 31.24
RSAs	\$ 25.29	\$ —	\$ —
PSUs	\$ 25.00	\$ 23.60	\$ 26.59
Total intrinsic value of awards exercised (in millions):			
Options	\$ 4.2	\$ 3.8	\$ 13.4
SARs	\$ 13.6	\$ 22.5	\$ 74.8
Cash received from exercise of options (in millions)	\$ 2.3	\$ 5.7	\$ 11.7
Income tax benefit related to share-based compensation of our continuing operations (in millions)	\$ 21.0	\$ 18.6	\$ 9.8

Share Incentive Plans — Liberty Global Ordinary Shares

Incentive Plans

As of December 31, 2019, we are authorized to grant incentive awards under the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan. Generally, we may grant non-qualified share options, SARs, PSARs, restricted shares, RSUs, cash awards, performance awards or any combination of the foregoing under either of these incentive plans (collectively, awards). Ordinary shares issuable pursuant to awards made under these incentive plans will be made available from either authorized but unissued shares or shares that have been issued but reacquired by our company. Awards may be granted at or above fair value in any class of ordinary shares. The maximum number of Liberty Global shares with respect to which awards may be issued under the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan is 155 million (of which no more than 50.25 million shares may consist of Class B ordinary shares) and 10.5 million, respectively, in each case, subject to anti-dilution and other adjustment provisions in the respective plan. As of December 31, 2019, the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan had 71,262,640 and 8,652,029 ordinary shares available for grant, respectively.

Awards (other than performance-based awards) under the Liberty Global 2014 Incentive Plan generally (i) vest 2.5% on the six month anniversary of the grant date and then vest at a rate of 6.25% each quarter thereafter and (ii) expire seven years after

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the grant date. Awards (other than RSUs) issued under the Liberty Global 2014 Nonemployee Director Incentive Plan generally vest in three equal annual installments, provided the director continues to serve as director immediately prior to the vesting date, and expire seven years after the grant date. RSUs vest on the date of the first annual general meeting of shareholders following the grant date. These awards may be granted at or above fair value in any class of ordinary shares.

Performance Awards

The following is a summary of the material terms and conditions with respect to our performance-based awards for certain executive officers and key employees.

Liberty Global PSUs

In March 2015, our compensation committee approved the grant of PSUs to executive officers and key employees (the **2015 PSUs**). The performance plan for the 2015 PSUs covered a two-year period that ended on December 31, 2016 and included a performance target based on the achievement of a specified compound annual growth rate (**CAGR**) in a consolidated Adjusted OIBDA metric (as defined in note 20). The performance target was adjusted for events such as acquisitions, dispositions and changes in foreign currency exchange rates that affect comparability (**Adjusted OIBDA CAGR**), and the participant's annual performance ratings during the two-year performance period. Participants earned 99.5% of their targeted awards under the 2015 PSUs, which vested 50% on each of April 1 and October 1 of 2017.

In February 2016, our compensation committee approved the grant of PSUs to executive officers and key employees (the **2016 PSUs**). The performance plan for the 2016 PSUs covered a three-year period that ended on December 31, 2018 and included a performance target based on the achievement of a specified Adjusted OIBDA CAGR. The 2016 PSUs, as adjusted through the 2017 Award Modification, required delivery of compound annual growth rates of consolidated Adjusted OIBDA CAGR of 6.0% during the three-year performance period for Liberty Global or Liberty Latin America depending on the respective class of shares underlying the award. Participants earned 82.3% of their targeted awards under the 2016 PSUs, which vested 50% on each of April 1, 2019 and October 1, 2019.

During 2018, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2018 PSUs**) pursuant to a performance plan that is based on the achievement of a specified Adjusted OIBDA CAGR during the two-year period ending December 31, 2019. The 2018 PSUs include over- and under-performance payout opportunities should the Adjusted OIBDA CAGR exceed or fail to meet the target, as applicable. A performance range of 50% to 125% of the target Adjusted OIBDA CAGR will generally result in award recipients earning 50% to 150% of their target 2018 PSUs, subject to reduction or forfeiture based on individual performance. The earned 2018 PSUs will vest 50% on each of April 1, 2020 and 50% on October 1, 2020. The target Adjusted OIBDA CAGR for the 2018 PSUs was determined on October 26, 2018 and, accordingly, associated compensation expense has been recognized prospectively from that date.

In April 2019, the compensation committee of our board of directors approved the grant of PSUs to executive officers and key employees (the **2019 PSUs**) pursuant to a performance plan that is based on the achievement of a specified Adjusted OIBDA CAGR during the two-year period ending December 31, 2020. The 2019 PSUs include over- and under-performance payout opportunities should the Adjusted OIBDA CAGR exceed or fail to meet the target, as applicable. A performance range of 50% to 125% of the target Adjusted OIBDA CAGR will generally result in award recipients earning 50% to 150% of their target 2019 PSUs, subject to reduction or forfeiture based on individual performance. The earned 2019 PSUs will vest 50% on April 1, 2021 and 50% on October 1, 2021.

2019 CEO Performance Award

In April 2019, the compensation committee of our board of directors approved the grant of RSAs and PSUs to our Chief Executive Officer (**CEO**) (the **2019 CEO Performance Award**), comprising 670,000 RSAs and 1,330,000 PSUs, each with respect to Liberty Global Class B ordinary shares. Subject to certain terms, the RSAs vested on December 31, 2019. Subject to forfeitures, the satisfaction of performance conditions and certain other terms, the PSUs will vest as follows: 670,000 Liberty Global Class B ordinary shares on May 15, 2020 and 660,000 Liberty Global Class B ordinary shares on May 15, 2021. Prior to vesting, our CEO may change the PSUs to a mix of Liberty Global Class A, B or C ordinary shares of comparable value. The performance criteria for the 2019 CEO Performance Award PSUs is based on the achievement of our CEO's performance conditions, as established by the compensation committee.

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2019 Challenge Performance Awards

In March 2019, the compensation committee of our board of directors approved a challenge performance award for executive officers and certain employees (the **2019 Challenge Performance Awards**), which consists of a combination of PSARs and PSUs, in each case divided on a 1:2 ratio based on Liberty Global Class A ordinary shares and Liberty Global Class C ordinary shares. Each PSU represents the right to receive one Liberty Global Class A ordinary share or one Liberty Global Class C ordinary share, as applicable. The performance criteria for the 2019 Challenge Performance Awards is based on the participant's performance and achievement of individual goals during a performance period of three years ending on December 31, 2021. Subject to forfeitures, the satisfaction of performance conditions and certain other terms, 100% of each participant's 2019 Challenge Performance Awards will vest on March 7, 2022. The PSARs have a term of ten years and base prices equal to the respective market closing prices of the applicable class on the grant date.

Share-based Award Activity — Liberty Global Ordinary Shares

The following tables summarize the share-based award activity during 2019 with respect to awards issued by Liberty Global:

Options — Class A ordinary shares	Number of awards	Weighted average exercise price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	580,254	\$ 27.51		
Granted	61,244	\$ 26.47		
Exercised	(53,240)	\$ 7.10		
Outstanding at December 31, 2019	588,258	\$ 29.25	3.7	\$ 0.7
Exercisable at December 31, 2019	447,042	\$ 29.40	2.6	\$ 0.7

Options — Class C ordinary shares	Number of awards	Weighted average exercise price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	2,667,506	\$ 25.09		
Granted	1,364,721	\$ 24.52		
Forfeited	(349,474)	\$ 24.79		
Exercised	(176,185)	\$ 6.92		
Outstanding at December 31, 2019	3,506,568	\$ 25.81	3.0	\$ 1.7
Exercisable at December 31, 2019	2,820,918	\$ 25.68	2.1	\$ 1.7

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SARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	15,308,562	\$ 32.41		
Granted	3,350,635	\$ 24.92		
Forfeited	(1,520,202)	\$ 32.62		
Exercised	(509,520)	\$ 19.91		
Impact of the sale of the Vodafone Disposal Group	(377,858)	\$ 34.89		
Outstanding at December 31, 2019	16,251,617	\$ 31.18	3.9	\$ —
Exercisable at December 31, 2019	10,951,161	\$ 32.66	2.4	\$ —
SARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	34,401,980	\$ 30.61		
Granted	6,701,270	\$ 24.17		
Forfeited	(3,042,500)	\$ 31.49		
Exercised	(1,599,608)	\$ 19.25		
Impact of the sale of the Vodafone Disposal Group	(778,280)	\$ 33.57		
Outstanding at December 31, 2019	35,682,862	\$ 29.77	3.6	\$ —
Exercisable at December 31, 2019	25,082,821	\$ 30.83	2.1	\$ —
PSARs — Class A ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	—	\$ —		
Granted	4,477,343	\$ 25.97		
Forfeited	(405,727)	\$ 25.97		
Outstanding at December 31, 2019	4,071,616	\$ 25.97	9.2	\$ —
Exercisable at December 31, 2019	1,118	\$ 25.97	0.8	\$ —
PSARs — Class C ordinary shares	Number of awards	Weighted average base price	Weighted average remaining contractual term	Aggregate intrinsic value
			in years	in millions
Outstanding at January 1, 2019	—	\$ —		
Granted	8,954,686	\$ 25.22		
Forfeited	(811,454)	\$ 25.22		
Outstanding at December 31, 2019	8,143,232	\$ 25.22	9.2	\$ —
Exercisable at December 31, 2019	2,236	\$ 25.22	0.8	\$ —

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RSUs — Class A ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	582,374	\$ 31.85	
Granted	359,012	\$ 25.09	
Forfeited	(141,043)	\$ 30.23	
Released from restrictions	(284,847)	\$ 31.34	
Outstanding at December 31, 2019	<u>515,496</u>	<u>\$ 27.86</u>	<u>2.5</u>

RSUs — Class B ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	—	\$ —	
Granted	48,786	\$ 26.03	
Outstanding at December 31, 2019	<u>48,786</u>	<u>\$ 26.03</u>	<u>0.2</u>

RSUs — Class C ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	1,162,351	\$ 31.02	
Granted	718,024	\$ 24.35	
Forfeited	(281,767)	\$ 30.32	
Released from restrictions	(572,598)	\$ 30.29	
Outstanding at December 31, 2019	<u>1,026,010</u>	<u>\$ 26.95</u>	<u>2.5</u>

RSAs — Class B ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	—	\$ —	
Granted	670,000	\$ 25.29	
Released from restrictions	(670,000)	\$ 25.29	
Outstanding at December 31, 2019	<u>—</u>	<u>\$ —</u>	<u>—</u>

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PSUs — Class A ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	2,904,644	\$ 28.22	
Granted	2,502,764	\$ 25.44	
Forfeited	(548,237)	\$ 28.58	
Released from restrictions	(1,416,391)	\$ 31.04	
Impact of the sale of the Vodafone Disposal Group	(54,409)	\$ 24.03	
Outstanding at December 31, 2019	<u>3,388,371</u>	<u>\$ 25.00</u>	<u>1.6</u>
PSUs — Class B ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	—	\$ —	
Granted	1,330,000	\$ 25.29	
Outstanding at December 31, 2019	<u>1,330,000</u>	<u>\$ 25.29</u>	<u>0.9</u>
PSUs — Class C ordinary shares	Number of awards	Weighted average grant-date fair value per share	Weighted average remaining contractual term
			in years
Outstanding at January 1, 2019	5,814,437	\$ 27.39	
Granted	5,005,528	\$ 24.69	
Forfeited	(1,098,252)	\$ 27.71	
Released from restrictions	(2,836,847)	\$ 30.06	
Impact of the sale of the Vodafone Disposal Group	(108,818)	\$ 23.41	
Outstanding at December 31, 2019	<u>6,776,048</u>	<u>\$ 24.29</u>	<u>1.6</u>

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Share-based Award Activity — Liberty Global Ordinary Shares Held by Former Liberty Global Employees

The following tables summarize the share-based awards issued by Liberty Global held by former employees of the company that (i) became employees of Liberty Latin America as a result of the Split-off Transaction and (ii) were employees of entities included in the Vodafone Disposal Group. We do not recognize share-based compensation expense with respect to these awards.

	Number of awards	Weighted average exercise or base price	Weighted average remaining contractual term	Aggregate intrinsic value
Options and SARs:				
Class A:				
Outstanding	1,509,447	\$ 33.96	2.0	\$ —
Exercisable	1,429,022	\$ 33.95	1.8	\$ —
Class C:				
Outstanding	3,374,752	\$ 32.08	1.8	\$ —
Exercisable	3,213,870	\$ 32.02	1.7	\$ —
	Number of awards	Weighted average grant date fair value per share	Weighted average remaining contractual term	
Outstanding RSUs and PSUs:				
Class A:				
RSUs	3,969	\$ 33.23	1.3	
PSUs	54,990	\$ 24.05	0.8	
Class C:				
RSUs	7,923	\$ 32.33	1.3	
PSUs	109,980	\$ 23.44	0.8	

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(16) Restructuring Liabilities

A summary of changes in our restructuring liabilities during 2019 is set forth in the table below:

	Employee severance and termination	Office closures	Contract termination	Total
in millions				
Restructuring liability as of January 1, 2019, before effect of accounting change	\$ 14.7	\$ 8.5	\$ 17.9	\$ 41.1
Accounting change (a)	—	(2.4)	—	(2.4)
Restructuring liability as of January 1, 2019, as adjusted for accounting change	14.7	6.1	17.9	38.7
Restructuring charges	84.3	1.1	4.5	89.9
Cash paid	(81.3)	(4.4)	(10.9)	(96.6)
Foreign currency translation adjustments and other	1.4	(0.6)	(0.9)	(0.1)
Restructuring liability as of December 31, 2019	\$ 19.1	\$ 2.2	\$ 10.6	\$ 31.9
Current portion	\$ 17.6	\$ 1.9	\$ 3.2	\$ 22.7
Noncurrent portion	1.5	0.3	7.4	9.2
Total	\$ 19.1	\$ 2.2	\$ 10.6	\$ 31.9

(a) Amount represents restructuring liabilities related to operating leases that have been reclassified to lease liabilities in connection with our January 1, 2019 adoption of ASU 2016-02. For additional information, see note 2.

Our restructuring charges during 2019 included employee severance and termination costs related to certain reorganization activities of \$40.2 million in U.K./Ireland, \$32.3 million in Central and Corporate and \$10.5 million in Switzerland.

A summary of changes in our restructuring liabilities during 2018 is set forth in the table below:

	Employee severance and termination	Office closures	Contract termination	Total
in millions				
Restructuring liability as of January 1, 2018	\$ 11.3	\$ 9.5	\$ 16.5	\$ 37.3
Restructuring charges	42.2	5.5	48.7	96.4
Cash paid	(35.5)	(6.0)	(44.7)	(86.2)
Foreign currency translation adjustments and other	(3.3)	(0.5)	(2.6)	(6.4)
Restructuring liability as of December 31, 2018	\$ 14.7	\$ 8.5	\$ 17.9	\$ 41.1
Current portion	\$ 13.3	\$ 4.5	\$ 8.4	\$ 26.2
Noncurrent portion	1.4	4.0	9.5	14.9
Total	\$ 14.7	\$ 8.5	\$ 17.9	\$ 41.1

Our restructuring charges during 2018 included (i) \$40.5 million of costs in Belgium attributed to the migration of Telenet's mobile subscribers from a mobile virtual network operator (MVNO) arrangement to Telenet's mobile network and (ii) employee

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severance and termination costs related to certain reorganization and integration activities of \$23.7 million in U.K./Ireland and \$14.2 million in Central and Corporate.

In connection with the acquisition of Telenet Group BVBA, formerly known as BASE Company BVBA (**BASE**), Telenet acquired BASE's mobile network in Belgium. As a result, Telenet migrated its mobile subscribers from an MVNO arrangement to the BASE mobile network. In March 2018, Telenet completed this migration and recorded the costs associated with meeting its minimum guarantee commitment under the MVNO agreement as a restructuring charge. Telenet's MVNO agreement expired at the end of 2018.

A summary of changes in our restructuring liabilities during 2017 is set forth in the table below:

	Employee severance and termination	Office closures	Contract termination	Total
in millions				
Restructuring liability as of January 1, 2017	\$ 23.0	\$ 7.1	\$ 31.7	\$ 61.8
Restructuring charges	35.2	8.3	4.9	48.4
Cash paid	(50.0)	(6.8)	(22.2)	(79.0)
Foreign currency translation adjustments and other	3.1	0.9	2.1	6.1
Restructuring liability as of December 31, 2017	<u>\$ 11.3</u>	<u>\$ 9.5</u>	<u>\$ 16.5</u>	<u>\$ 37.3</u>
Current portion	\$ 9.9	\$ 4.4	\$ 4.6	\$ 18.9
Noncurrent portion	1.4	5.1	11.9	18.4
Total	<u>\$ 11.3</u>	<u>\$ 9.5</u>	<u>\$ 16.5</u>	<u>\$ 37.3</u>

Our restructuring charges during 2017 included employee severance and termination costs related to certain reorganization and integration activities of \$20.1 million in U.K./Ireland and \$10.0 million in Central and Corporate.

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(17) Defined Benefit Plans

Certain of our subsidiaries maintain various funded and unfunded defined benefit plans for their employees. A significant portion of these defined benefit plans are closed to new entrants, and existing participants do not accrue any additional benefits.

The table below provides summary information on the defined benefit plans:

	December 31,		
	2019	2018	2017
in millions			
Fair value of plan assets (a)	\$ 1,500.0	\$ 1,305.0	\$ 1,412.2
Projected benefit obligation	\$ 1,407.5	\$ 1,217.5	\$ 1,335.4
Net asset	\$ 92.5	\$ 87.5	\$ 76.8

- (a) The fair value of plan assets at December 31, 2019 includes \$1,120.1 million, \$113.3 million and \$266.6 million of assets that are valued based on Level 1, Level 2 and Level 3 inputs, respectively, of the fair value hierarchy (as further described in note 9). Our plan assets comprise investments in debt securities, equity securities, hedge funds, insurance contracts and certain other assets.

Our net periodic pension cost was \$8.6 million, \$7.4 million and \$4.0 million during 2019, 2018 and 2017, respectively, including \$20.9 million, \$24.4 million and \$22.2 million, respectively, representing the service cost component. The 2019 and 2018 amounts exclude aggregate curtailment gains of \$1.4 million and \$1.1 million, respectively, which are included in impairment, restructuring and other operating items, net, in our consolidated statements of operations.

During 2019, our subsidiaries' contributions to their respective defined benefit plans aggregated \$26.5 million. Based on December 31, 2019 exchange rates and information available as of that date, we expect this amount to be \$27.4 million in 2020.

(18) Accumulated Other Comprehensive Earnings (Loss)

Accumulated other comprehensive earnings (loss) included on our consolidated balance sheets and statements of equity reflect the aggregate impact of foreign currency translation adjustments and pension-related adjustments and other. The changes in the components of accumulated other comprehensive earnings (loss), net of taxes, are summarized as follows:

	Liberty Global shareholders				Noncontrolling interests	Total accumulated other comprehensive earnings (loss)
	Foreign currency translation adjustments	Pension-related adjustments and other	Accumulated other comprehensive earnings (loss)			
in millions						
Balance at January 1, 2017	\$ (272.6)	\$ (99.8)	\$ (372.4)	\$ (5.9)	\$ (378.3)	
Other comprehensive earnings	1,942.8	0.3	1,943.1	1.7	1,944.8	
Impact of the Split-off Transaction	56.4	28.9	85.3	—	85.3	
Balance at December 31, 2017	1,726.6	(70.6)	1,656.0	(4.2)	1,651.8	
Other comprehensive loss	(1,007.3)	(16.9)	(1,024.2)	0.2	(1,024.0)	
Balance at December 31, 2018	719.3	(87.5)	631.8	(4.0)	627.8	
Other comprehensive earnings	490.3	(9.4)	480.9	1.2	482.1	
Balance at December 31, 2019	\$ 1,209.6	\$ (96.9)	\$ 1,112.7	\$ (2.8)	\$ 1,109.9	

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The components of other comprehensive earnings (loss), net of taxes, are reflected in our consolidated statements of comprehensive earnings (loss). The following table summarizes the tax effects related to each component of other comprehensive earnings (loss), net, of amounts reclassified to our consolidated statements of operations:

	Pre-tax amount	Tax benefit (expense)	Net-of-tax amount
	in millions		
Year ended December 31, 2019:			
Foreign currency translation adjustments	\$ 432.2	\$ 3.3	\$ 435.5
Pension-related adjustments and other	(16.7)	2.3	(14.4)
Other comprehensive earnings from continuing operations	415.5	5.6	421.1
Other comprehensive earnings from discontinued operations (a)	61.1	(0.1)	61.0
Other comprehensive earnings	476.6	5.5	482.1
Other comprehensive earnings attributable to noncontrolling interests (b)	(1.5)	0.3	(1.2)
Other comprehensive earnings attributable to Liberty Global shareholders	\$ 475.1	\$ 5.8	\$ 480.9
Year ended December 31, 2018:			
Foreign currency translation adjustments	\$ (897.9)	\$ —	\$ (897.9)
Pension-related adjustments and other	(24.4)	4.4	(20.0)
Other comprehensive loss from continuing operations	(922.3)	4.4	(917.9)
Other comprehensive loss from discontinued operations (a)	(105.9)	(0.2)	(106.1)
Other comprehensive loss	(1,028.2)	4.2	(1,024.0)
Other comprehensive earnings attributable to noncontrolling interests (b)	(0.3)	0.1	(0.2)
Other comprehensive loss attributable to Liberty Global shareholders	\$ (1,028.5)	\$ 4.3	\$ (1,024.2)
Year ended December 31, 2017:			
Foreign currency translation adjustments	\$ 1,898.7	\$ —	\$ 1,898.7
Pension-related adjustments	17.6	(1.9)	15.7
Other comprehensive earnings from continuing operations	1,916.3	(1.9)	1,914.4
Other comprehensive earnings from discontinued operations	30.1	0.3	30.4
Other comprehensive earnings	1,946.4	(1.6)	1,944.8
Other comprehensive earnings attributable to noncontrolling interests (b)	(1.9)	0.2	(1.7)
Other comprehensive earnings attributable to Liberty Global shareholders	\$ 1,944.5	\$ (1.4)	\$ 1,943.1

(a) For additional information regarding the reclassification of foreign currency translation adjustments included in net earnings, see note 6.

(b) Amounts represent the noncontrolling interest owners' share of our pension-related adjustments.

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(19) Commitments and Contingencies

Commitments

In the normal course of business, we have entered into agreements that commit our company to make cash payments in future periods with respect to programming contracts, network and connectivity commitments, purchases of customer premises and other equipment and services and other items. The following table sets forth the U.S. dollar equivalents of such commitments as of December 31, 2019. The commitments included in this table do not reflect any liabilities that are included on our December 31, 2019 consolidated balance sheet.

	Payments due during:						Total
	2020	2021	2022	2023	2024	Thereafter	
in millions							
Programming commitments	\$ 1,165.0	\$ 887.4	\$ 355.3	\$ 17.5	\$ 14.2	\$ 30.4	\$ 2,469.8
Network and connectivity commitments	715.3	313.3	98.3	46.9	39.9	736.1	1,949.8
Purchase commitments	668.0	181.5	60.8	35.9	17.3	25.1	988.6
Other commitments	30.0	3.4	2.0	0.3	0.3	1.0	37.0
Total	<u>\$ 2,578.3</u>	<u>\$ 1,385.6</u>	<u>\$ 516.4</u>	<u>\$ 100.6</u>	<u>\$ 71.7</u>	<u>\$ 792.6</u>	<u>\$ 5,445.2</u>

Programming commitments consist of obligations associated with certain of our programming, studio output and sports rights contracts that are enforceable and legally binding on us as we have agreed to pay minimum fees without regard to (i) the actual number of subscribers to the programming services, (ii) whether we terminate service to a portion of our subscribers or dispose of a portion of our distribution systems or (iii) whether we discontinue our premium sports services. Programming commitments do not include increases in future periods associated with contractual inflation or other price adjustments that are not fixed. Accordingly, the amounts reflected in the above table with respect to these contracts are significantly less than the amounts we expect to pay in these periods under these contracts. Historically, payments to programming vendors have represented a significant portion of our operating costs, and we expect this will continue to be the case in future periods. In this regard, our total programming and copyright costs aggregated \$1,702.4 million, \$1,671.4 million and \$1,470.2 million during 2019, 2018 and 2017, respectively.

Network and connectivity commitments include (i) Telenet's commitments for certain operating costs associated with its leased network, (ii) commitments associated with our MVNO agreements, primarily in the U.K., and (iii) service commitments associated with our network extension projects, primarily in the U.K. Telenet's commitments for certain operating costs are subject to adjustment based on changes in the network operating costs incurred by Telenet with respect to its own networks. These potential adjustments are not subject to reasonable estimation and, therefore, are not included in the above table. The amounts reflected in the above table with respect to certain of our MVNO commitments represent fixed minimum amounts payable under these agreements and, therefore, may be significantly less than the actual amounts we ultimately pay in these periods.

Purchase commitments include unconditional and legally binding obligations related to (i) the purchase of customer premises and other equipment and (ii) certain service-related commitments, including call center, information technology and maintenance services.

In addition to the commitments set forth in the table above, we have significant commitments under (i) derivative instruments and (ii) defined benefit plans and similar agreements, pursuant to which we expect to make payments in future periods. For information regarding our derivative instruments, including the net cash paid or received in connection with these instruments during 2019, 2018 and 2017, see note 8. For information regarding our defined benefit plans, see note 17.

We also have commitments pursuant to agreements with, and obligations imposed by, franchise authorities and municipalities, which may include obligations in certain markets to move aerial cable to underground ducts or to upgrade, rebuild or extend portions of our broadband communication systems. Such amounts are not included in the above table because they are not fixed or determinable.

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Rental expense under non-cancellable operating lease arrangements amounted to \$111.8 million and \$104.5 million during 2018 and 2017, respectively. It is expected that in the normal course of business, operating leases that expire generally will be renewed or replaced by similar leases.

We have established various defined contribution benefit plans for our and our subsidiaries' employees. Our aggregate expense for matching contributions under the various defined contribution employee benefit plans was \$42.6 million, \$41.0 million and \$34.7 million during 2019, 2018 and 2017, respectively.

Guarantees and Other Credit Enhancements

In the ordinary course of business, we may provide (i) indemnifications to our lenders, our vendors and certain other parties and (ii) performance and/or financial guarantees to local municipalities, our customers and vendors. Historically, these arrangements have not resulted in our company making any material payments and we do not believe that they will result in material payments in the future.

Legal and Regulatory Proceedings and Other Contingencies

Interkabel Acquisition. On November 26, 2007, Telenet and the PICs announced a non-binding agreement-in-principle to transfer the analog and digital television activities of the PICs, including all existing subscribers, to Telenet. Subsequently, Telenet and the PICs entered into a binding agreement (the **2008 PICs Agreement**), which closed effective October 1, 2008. Beginning in December 2007, Proximus NV/SA (**Proximus**), the incumbent telecommunications operator in Belgium, instituted several proceedings seeking to block implementation of these agreements. Proximus lodged summary proceedings with the President of the Court of First Instance of Antwerp to obtain a provisional injunction preventing the PICs from effecting the agreement-in-principle and initiated a civil procedure on the merits claiming the annulment of the agreement-in-principle. In March 2008, the President of the Court of First Instance of Antwerp ruled in favor of Proximus in the summary proceedings, which ruling was overturned by the Court of Appeal of Antwerp in June 2008. Proximus brought this appeal judgment before the Cour de Cassation (the **Belgian Supreme Court**), which confirmed the appeal judgment in September 2010. On April 6, 2009, the Court of First Instance of Antwerp ruled in favor of the PICs and Telenet in the civil procedure on the merits, dismissing Proximus's request for the rescission of the agreement-in-principle and the 2008 PICs Agreement. On June 12, 2009, Proximus appealed this judgment with the Court of Appeal of Antwerp. In this appeal, Proximus is now also seeking compensation for damages. While these proceedings were suspended indefinitely, other proceedings were initiated, which resulted in a ruling by the Belgian Council of State in May 2014 annulling (i) the decision of the PICs not to organize a public market consultation and (ii) the decision from the PICs' board of directors to approve the 2008 PICs Agreement. In December 2015, Proximus resumed the civil proceedings pending with the Court of Appeal of Antwerp seeking to have the 2008 PICs Agreement annulled and claiming damages of €1.4 billion (\$1.6 billion).

In December 2017, the Court of Appeals of Antwerp issued a judgment rejecting Proximus' claims. In June 2019, Proximus filed an appeal of the Court of Appeals of Antwerp's judgment with the Belgian Supreme Court. No assurance can be given as to the outcome of these or other proceedings. However, an unfavorable outcome of existing or future proceedings could potentially lead to the annulment of the 2008 PICs Agreement and/or to an obligation of Telenet to pay compensation for damages, subject to the relevant provisions of the 2008 PICs Agreement, which stipulate that Telenet is responsible for damages in excess of €20.0 million (\$22.5 million). We do not expect the ultimate resolution of this matter to have a material impact on our results of operations, cash flows or financial position. No amounts have been accrued by us with respect to this matter as the likelihood of loss is not considered to be probable.

Telekom Deutschland Litigation. On December 28, 2012, Unitymedia filed a lawsuit against Telekom Deutschland GmbH (**Telekom Deutschland**) in which Unitymedia asserts that it pays excessive prices for the co-use of Telekom Deutschland's cable ducts in Unitymedia's footprint. The Federal Network Agency approved rates for the co-use of certain ducts of Telekom Deutschland in March 2011. Based in part on these approved rates, Unitymedia sought a reduction of the annual lease fees by approximately five-sixths. In addition, Unitymedia is seeking the return of similarly calculated overpayments from 2009 through the ultimate settlement date, plus accrued interest. In October 2016, the first instance court dismissed this action, and in March 2018, the court of appeal dismissed Unitymedia's appeal of the first instance court's decision and did not grant permission to appeal further to the Federal Court of Justice. Unitymedia has filed a motion with the Federal Court of Justice to grant permission to appeal. The resolution of this matter may take several years and no assurance can be given that Unitymedia's claims will be successful. In connection with our sale of the Vodafone Disposal Group, we will only share in 50% of any amounts recovered, plus 50% of the

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net present value of certain cost savings in future periods that are attributable to the favorable resolution of this matter, less 50% of associated legal or other third-party fees paid post-completion of the sale of the Vodafone Disposal Group. Any amount we may recover related to this matter will not be reflected in our consolidated financial statements until such time as the final disposition of this matter has been reached.

Belgium Regulatory Developments. In June 2018, the Belgisch Instituut voor Post en Telecommunicatie and the regional regulators for the media sectors (together, the **Belgium Regulatory Authorities**) adopted a new decision finding that Telenet has significant market power in the wholesale broadband market (the **2018 Decision**). The 2018 Decision imposes on Telenet the obligations to (i) provide third-party operators with access to the digital television platform (including basic digital video and analog video) and (ii) make available to third-party operators a bitstream offer of broadband internet access (including fixed-line telephony as an option). Unlike prior decisions, the 2018 Decision no longer applies “retail minus” pricing on Telenet; however, as of August 1, 2018, this decision imposes a 17% reduction in monthly wholesale cable resale access prices for an interim period. On July 5, 2019, the Belgium Regulatory Authorities published for consultation a draft decision regarding “reasonable access tariffs” that will replace the interim prices. As applicable to Telenet, the proposed tariffs represent an estimated additional 25% reduction compared to the interim prices. In September 2019, Telenet submitted its comments to the Belgium Regulatory Authorities opposing the “reasonable access tariffs.” The Belgium Regulatory Authorities originally indicated their intention to adopt a final decision in the fourth quarter of 2019, with the application of new tariffs in early 2020, however the European Commission review process, which must occur before adoption of a final decision, has yet to be undertaken.

The 2018 Decision aims to, and in its application, may strengthen Telenet’s competitors by granting them resale access to Telenet’s network to offer competing products and services notwithstanding Telenet’s substantial historical financial outlays in developing the infrastructure. In addition, any resale access granted to competitors could (i) limit the bandwidth available to Telenet to provide new or expanded products and services to the customers served by its network and (ii) adversely impact Telenet’s ability to maintain or increase its revenue and cash flows. The extent of any such adverse impacts ultimately will be dependent on the extent that competitors take advantage of the resale access afforded to Telenet’s network, the rates that Telenet receives for such access and other competitive factors or market developments. Telenet considers the 2018 Decision to be inconsistent with the principle of technology-neutral regulation and the European Single Market Strategy to stimulate further investments in broadband networks. Telenet has challenged the 2018 Decision in the Brussels Court of Appeal and also initiated an action in the European Court of Justice against the European Commission’s decision not to challenge the 2018 Decision. The proceedings before the European Court of Justice, however, have been withdrawn by Telenet in order to avoid undue delays in the Brussels Court of Appeal case. In September 2019, the Brussels Court of Appeal upheld the 2018 Decision, and consequently, the above-mentioned obligations stemming from the 2018 Decision remain in place. Telenet is currently considering whether to appeal the decision further.

Virgin Media VAT Matters. Virgin Media’s application of VAT with respect to certain revenue generating activities has been challenged by the U.K. tax authorities (**HMRC**). HMRC claimed that amounts charged to certain Virgin Media customers for payment handling services are subject to VAT, while Virgin Media took the position that such charges were exempt from VAT under existing law. At the time of HMRC’s initial challenge in 2009, Virgin Media remitted all related VAT amounts claimed by HMRC, and continued to make such VAT payments pending a ruling on Virgin Media’s appeal to the First Tier Tribunal. As the likelihood of loss was not considered probable and Virgin Media believed that the amounts paid would be recoverable, such amounts were recorded as a receivable on our consolidated balance sheet. In January 2020, the First Tier Tribunal rejected our appeal and ruled in favor of HMRC. Accordingly, during the fourth quarter of 2019 we recorded a net provision for litigation of £41.3 million (\$54.0 million at the applicable rate), which is included in impairment, restructuring and other operating items, net, in our consolidated statement of operations. Virgin Media is currently considering whether to appeal this decision further.

On March 19, 2014, the U.K. government announced a change in legislation with respect to the charging of VAT in connection with prompt payment discounts such as those that we offer to our fixed-line telephony customers. This change, which took effect on May 1, 2014, impacted our company and some of our competitors. HMRC issued a decision in the fourth quarter of 2015 challenging our application of the prompt payment discount rules prior to the May 1, 2014 change in legislation. We appealed this decision. As part of the appeal process, we were required to make aggregate payments of £67.0 million (\$99.1 million at the respective transaction dates), comprising (i) the challenged amount of £63.7 million (which we paid during the fourth quarter of 2015) and (ii) related interest of £3.3 million (which we paid during the first quarter of 2016). No provision was recorded by our company at that time as the likelihood of loss was not considered to be probable. The aggregate amount paid does not include penalties, which could be significant in the event that penalties were to be assessed. In September 2018, the court rejected our appeal and ruled in favor of HMRC. Accordingly, during the third quarter of 2018, we recorded a provision for litigation of £63.7 million (\$83.1 million at the average rate for the period) and related interest expense of £3.3 million (\$4.4 million at the average

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rate for the period) in our consolidated statement of operations. The First Tier Tribunal gave permission to appeal to the Upper Tribunal and we submitted grounds for appeal on February 22, 2019. We expect the hearing to take place in the first half of 2020; however, no assurance can be given as to the ultimate outcome of this matter.

UPC Austria Matter. As further described in note 6, we completed the sale of UPC Austria on July 31, 2018. In October of 2019, we received notification under the terms of the relevant acquisition agreements from Deutsche Telekom and its subsidiary T-Mobile Austria Holding GmbH (together, the **UPC Austria Sale Counterparties**), asserting claims of approximately €70.5 million (\$79.2 million) together with an invitation to engage in amicable discussions to resolve the matter in a time and cost effective manner. We since received further asserted claims of approximately €20.6 million (\$23.1 million). Discussions regarding the claims are preliminary and no amounts have been accrued by our company with respect to this matter as the likelihood of loss is not considered to be probable at this stage. We are unable to provide any meaningful estimate of a possible range of loss because, among other reasons, (i) we believe the assertions are unsupported and/or exaggerated, (ii) there are significant factual matters to be resolved and (iii) the matter is in a preliminary stage and we have yet to engage in detail with the UPC Austria Sale Counterparties. The acquisition agreement provides for arbitration of disputes in the event the parties are unable to resolve any differences. We intend to vigorously defend this matter.

Other Contingency Matters. In connection with the dispositions of certain of our operations, we provided tax indemnities to the counterparties for certain tax liabilities that could arise from the period we owned the respective operations, subject to certain thresholds. While we have not received notification from the counterparties for indemnification, it is reasonably possible that we could, and the amounts involved could be significant. No amounts have been accrued by our company as the likelihood of any loss is not considered to be probable.

Other Regulatory Matters. Video distribution, broadband internet, fixed-line telephony, mobile and content businesses are regulated in each of the countries in which we or our affiliates operate. The scope of regulation varies from country to country, although in some significant respects regulation in European markets is harmonized under the regulatory structure of the European Union (**E.U.**). Adverse regulatory developments could subject our businesses to a number of risks. Regulation, including conditions imposed on us by competition or other authorities as a requirement to close acquisitions or dispositions, could limit growth, revenue and the number and types of services offered and could lead to increased operating costs and property and equipment additions. In addition, regulation may restrict our operations and subject them to further competitive pressure, including pricing restrictions, interconnect and other access obligations, and restrictions or controls on content, including content provided by third parties. Failure to comply with current or future regulation could expose our businesses to various penalties.

Effective April 1, 2017, the rateable value of our existing network and other assets in the U.K. increased significantly. This increase affects the amount we pay for network infrastructure charges as the annual amount payable to the U.K. government is calculated by applying a percentage multiplier to the rateable value of assets. This change has and will continue to significantly increase our network infrastructure charges. As compared to 2019, we expect the aggregate amount of this increase will be approximately £17 million (\$23 million) in 2020. Beyond 2020, we expect further but declining increases to these charges through the first quarter of 2022. We continue to believe that these increases are excessive and retain the right of appeal should more favorable agreements be reached with other operators. The rateable value of our network and other assets in the U.K. remains subject to review by the U.K. government.

The U.K. Office of Communications (**Ofcom**) is the key regulatory authority for the communications sector in which we operate in the U.K. Ofcom has recently issued new regulatory requirements that, effective in February 2020, obligate us to (i) alert customers who are approaching the end of a minimum contract term to the fact that their contract period is coming to an end and to set out the best new price that we can offer them and (ii) once a year, alert customers who are out of contract to that fact and again confirm the best new price we can offer them. In both cases, we must also set out the price available to new customers for an equivalent service offering. These requirements could have a material adverse impact on our revenue and Adjusted OIBDA in 2020 and future periods. For additional information see *Item 1. Business - Regulatory Matters* included in Part I of this Annual Report on Form 10-K.

In addition to the foregoing items, we have contingent liabilities related to matters arising in the ordinary course of business including (i) legal proceedings, (ii) issues involving VAT and wage, property, withholding and other tax issues and (iii) disputes over interconnection, programming, copyright and channel carriage fees. While we generally expect that the amounts required to satisfy these contingencies will not materially differ from any estimated amounts we have accrued, no assurance can be given that the resolution of one or more of these contingencies will not result in a material impact on our results of operations, cash flows

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or financial position in any given period. Due, in general, to the complexity of the issues involved and, in certain cases, the lack of a clear basis for predicting outcomes, we cannot provide a meaningful range of potential losses or cash outflows that might result from any unfavorable outcomes.

(20) Segment Reporting

We generally identify our reportable segments as (i) those consolidated subsidiaries that represent 10% or more of our revenue, Adjusted OIBDA (as defined below) or total assets or (ii) those equity method affiliates where our investment or share of revenue or Adjusted OIBDA represents 10% or more of our total assets, revenue or Adjusted OIBDA, respectively. In certain cases, we may elect to include an operating segment in our segment disclosure that does not meet the above-described criteria for a reportable segment. We evaluate performance and make decisions about allocating resources to our operating segments based on financial measures such as revenue and Adjusted OIBDA. In addition, we review non-financial measures such as subscriber growth, as appropriate.

Adjusted OIBDA is the primary measure used by our chief operating decision maker to evaluate segment operating performance and is also a key factor that is used by our internal decision makers to (i) determine how to allocate resources to segments and (ii) evaluate the effectiveness of our management for purposes of annual and other incentive compensation plans. As we use the term, “**Adjusted OIBDA**” is defined as operating income before depreciation and amortization, share-based compensation, provisions and provision releases related to significant litigation and impairment, restructuring and other operating items. Other operating items include (a) gains and losses on the disposition of long-lived assets, (b) third-party costs directly associated with successful and unsuccessful acquisitions and dispositions, including legal, advisory and due diligence fees, as applicable, and (c) other acquisition-related items, such as gains and losses on the settlement of contingent consideration. Our internal decision makers believe Adjusted OIBDA is a meaningful measure because it represents a transparent view of our recurring operating performance that is unaffected by our capital structure and allows management to (1) readily view operating trends, (2) perform analytical comparisons and benchmarking between segments and (3) identify strategies to improve operating performance in the different countries in which we operate. A reconciliation of Adjusted OIBDA from continuing operations to earnings (loss) from continuing operations before income taxes is presented below.

As of December 31, 2019, our reportable segments are as follows:

Consolidated:

- U.K./Ireland
- Belgium
- Switzerland
- Central and Eastern Europe

Nonconsolidated:

- VodafoneZiggo
JV

All of our reportable segments derive their revenue primarily from residential and B2B communications services, including broadband internet, video, fixed-line telephony and mobile services.

Our central and corporate functions (**Central and Corporate**) primarily include (i) revenue earned from services provided to the VodafoneZiggo JV, (ii) revenue from sales of customer premises equipment to the VodafoneZiggo JV, (iii) costs associated with certain centralized functions, including billing systems, network operations, technology, marketing, facilities, finance and other administrative functions and (iv) less significant consolidated operating segments that provide programming and other services.

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During the fourth quarter of 2019, we changed the presentation of certain costs related to our centrally-managed technology and innovation function. These costs, which were previously included in Central and Corporate, are now allocated to our consolidated reportable segments. This change, which we refer to as the “**Centrally-held Cost Allocation**”, was made as a result of internal changes with respect to the way in which our chief operating decision maker evaluates the Adjusted OIBDA of our operating segments. Segment information for all periods presented has been revised to reflect this change. The following table provides a summary of the impact on the Adjusted OIBDA of our consolidated reportable segments and Central and Corporate that resulted from the Centrally-held Cost Allocation.

	Year ended December 31,		
	2019	2018	2017
in millions			
Increase (decrease) to Adjusted OIBDA:			
U.K./Ireland	\$ (66.6)	\$ (61.7)	\$ (52.8)
Switzerland	(33.0)	(36.7)	(32.3)
Central and Eastern Europe	(14.7)	(15.5)	(13.4)
Central and Corporate	114.3	113.9	98.5
Total Liberty Global	<u>\$ —</u>	<u>\$ —</u>	<u>\$ —</u>

Performance Measures of Our Reportable Segments

The amounts presented below represent 100% of each of our reportable segment’s revenue and Adjusted OIBDA. As we have the ability to control Telenet, we consolidate 100% of Telenet’s revenue and expenses in our consolidated statements of operations despite the fact that third parties own a significant interest. The noncontrolling owners’ interests in the operating results of Telenet and other less significant majority-owned subsidiaries are reflected in net earnings or loss attributable to noncontrolling interests in our consolidated statements of operations. Similarly, despite only holding a 50% noncontrolling interest in the VodafoneZiggo JV, we present 100% of its revenue and Adjusted OIBDA in the tables below. Our share of the VodafoneZiggo JV’s operating results is included in share of results of affiliates, net, in our consolidated statements of operations.

	Year ended December 31,					
	2019		2018		2017	
	Revenue	Adjusted OIBDA	Revenue	Adjusted OIBDA (b)	Revenue	Adjusted OIBDA (b)
in millions						
U.K./Ireland	\$ 6,600.3	\$ 2,800.5	\$ 6,875.1	\$ 2,995.5	\$ 6,398.7	\$ 2,831.2
Belgium	2,893.0	1,386.1	2,993.6	1,480.0	2,865.3	1,300.3
Switzerland	1,258.8	627.9	1,326.0	712.0	1,370.1	800.3
Central and Eastern Europe	475.4	215.0	492.2	233.6	467.5	220.1
Central and Corporate	316.4	(171.1)	274.2	(257.8)	189.4	(317.3)
Intersegment eliminations (a)	(2.4)	1.1	(3.2)	(11.8)	(14.6)	(9.5)
Total	<u>\$ 11,541.5</u>	<u>\$ 4,859.5</u>	<u>\$ 11,957.9</u>	<u>\$ 5,151.5</u>	<u>\$ 11,276.4</u>	<u>\$ 4,825.1</u>
VodafoneZiggo JV	<u>\$ 4,407.8</u>	<u>\$ 1,987.7</u>	<u>\$ 4,602.2</u>	<u>\$ 2,009.7</u>	<u>\$ 4,512.5</u>	<u>\$ 1,910.6</u>

(a) Amounts are related to transactions between our continuing and discontinued operations prior to the disposal dates of such discontinued operations.

(b) Amounts have been revised to reflect the retrospective impact of the Centrally-held Cost Allocation, as described above.

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The following table provides a reconciliation of Adjusted OIBDA from continuing operations to earnings (loss) from continuing operations before income taxes:

	Year ended December 31,		
	2019	2018	2017
	in millions		
Adjusted OIBDA from continuing operations	\$ 4,859.5	\$ 5,151.5	\$ 4,825.1
Share-based compensation expense	(305.8)	(206.0)	(162.2)
Depreciation and amortization	(3,652.2)	(3,858.2)	(3,790.6)
Impairment, restructuring and other operating items, net	(156.0)	(248.2)	(79.9)
Operating income	745.5	839.1	792.4
Interest expense	(1,385.9)	(1,478.7)	(1,416.1)
Realized and unrealized gains (losses) on derivative instruments, net	(192.0)	1,125.8	(1,052.8)
Foreign currency transaction gains (losses), net	(94.8)	90.4	(181.5)
Realized and unrealized gains (losses) due to changes in fair values of certain investments and debt, net	72.0	(384.5)	43.4
Losses on debt modification and extinguishment, net	(216.7)	(65.0)	(252.2)
Share of results of affiliates, net	(198.5)	(8.7)	(95.2)
Other income, net	114.4	43.4	50.9
Earnings (loss) from continuing operations before income taxes	\$ (1,156.0)	\$ 161.8	\$ (2,111.1)

Balance Sheet Data of our Reportable Segments

Selected balance sheet data of our reportable segments is set forth below:

	Long-lived assets		Total assets	
	December 31,		December 31,	
	2019	2018	2019	2018
	in millions			
U.K./Ireland	\$ 16,170.9	\$ 16,254.6	\$ 20,665.5	\$ 20,702.5
Belgium	5,910.3	5,979.4	7,148.2	6,972.1
Switzerland	4,247.7	4,165.4	4,647.8	4,496.0
Central and Eastern Europe	1,062.2	1,087.4	1,135.2	1,130.8
Central and Corporate	1,079.6	1,142.2	15,449.6	9,321.1
Total - continuing operations	\$ 28,470.7	\$ 28,629.0	\$ 49,046.3	\$ 42,622.5
VodafoneZiggo JV	\$ 20,674.8	\$ 22,026.2	\$ 22,426.5	\$ 23,255.3

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Property and Equipment Additions of our Reportable Segments

The property and equipment additions of our reportable segments (including capital additions financed under vendor financing or finance lease arrangements) are presented below and reconciled to the capital expenditure amounts included in our consolidated statements of cash flows. For additional information concerning capital additions financed under vendor financing and finance lease arrangements, see notes 10 and 12, respectively.

	Year ended December 31,		
	2019	2018	2017
in millions			
U.K./Ireland	\$ 1,578.0	\$ 1,988.9	\$ 2,161.8
Belgium	537.2	790.8	691.0
Switzerland	277.9	249.6	244.4
Central and Eastern Europe	107.0	152.8	158.2
Central and Corporate (a)	380.4	523.5	448.1
Total property and equipment additions	2,880.5	3,705.6	3,703.5
Assets acquired under capital-related vendor financing arrangements	(1,727.0)	(2,175.5)	(2,336.2)
Assets acquired under finance leases	(66.9)	(102.4)	(106.7)
Changes in current liabilities related to capital expenditures	156.5	25.3	(10.6)
Total capital expenditures, net	<u>\$ 1,243.1</u>	<u>\$ 1,453.0</u>	<u>\$ 1,250.0</u>
Capital expenditures, net:			
Third-party payments	\$ 1,323.9	\$ 1,552.7	\$ 1,586.5
Proceeds received for transfers to related parties (b)	(80.8)	(99.7)	(336.5)
Total capital expenditures, net	<u>\$ 1,243.1</u>	<u>\$ 1,453.0</u>	<u>\$ 1,250.0</u>
Property and equipment additions - VodafoneZiggo JV	<u>\$ 887.9</u>	<u>\$ 988.7</u>	<u>\$ 933.9</u>

(a) Includes (i) property and equipment additions representing centrally-owned assets that benefit our operating segments and (ii) the net impact of certain centrally-procured network equipment that is ultimately transferred to our operating segments.

(b) Primarily relates to transfers of centrally-procured property and equipment to our discontinued operations and the VodafoneZiggo JV.

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Revenue by Major Category

Our revenue by major category for our consolidated reportable segments is set forth below:

	Year ended December 31,		
	2019	2018	2017
in millions			
Residential revenue:			
Residential cable revenue (a):			
Subscription revenue (b):			
Broadband internet	\$ 3,187.4	\$ 3,226.6	\$ 2,979.7
Video	2,723.9	2,863.2	2,786.5
Fixed-line telephony	1,413.2	1,607.8	1,599.8
Total subscription revenue	7,324.5	7,697.6	7,366.0
Non-subscription revenue	198.1	279.1	343.6
Total residential cable revenue	7,522.6	7,976.7	7,709.6
Residential mobile revenue (c):			
Subscription revenue (b)	932.1	983.5	999.7
Non-subscription revenue	688.2	694.8	607.1
Total residential mobile revenue	1,620.3	1,678.3	1,606.8
Total residential revenue	9,142.9	9,655.0	9,316.4
B2B revenue (d):			
Subscription revenue	472.5	446.4	367.6
Non-subscription revenue	1,441.5	1,537.1	1,372.5
Total B2B revenue	1,914.0	1,983.5	1,740.1
Other revenue (e)			
Total	\$ 484.6	\$ 319.4	\$ 219.9
Total	\$ 11,541.5	\$ 11,957.9	\$ 11,276.4

- (a) Residential cable subscription revenue includes amounts received from subscribers for ongoing services and the recognition of deferred installation revenue over the associated contract period. Residential cable non-subscription revenue includes, among other items, channel carriage fees, late fees and revenue from the sale of equipment. As described in note 2, we adopted ASU 2014-09 on January 1, 2018 using the cumulative effect transition method. For periods subsequent to our adoption of ASU 2014-09, installation revenue is generally deferred and recognized over the contractual period as residential cable subscription revenue. For periods prior to the adoption of ASU 2014-09, installation revenue is included in residential cable non-subscription revenue.
- (b) Residential subscription revenue from subscribers who purchase bundled services at a discounted rate is generally allocated proportionally to each service based on the standalone price for each individual service. As a result, changes in the standalone pricing of our cable and mobile products or the composition of bundles can contribute to changes in our product revenue categories from period to period.
- (c) Residential mobile subscription revenue includes amounts received from subscribers for ongoing services. Residential mobile non-subscription revenue includes, among other items, interconnect revenue and revenue from sales of mobile handsets and other devices.
- (d) B2B subscription revenue represents revenue from services to certain small or home office (SOHO) subscribers. SOHO subscribers pay a premium price to receive expanded service levels along with broadband internet, video, fixed-line telephony or mobile services that are the same or similar to the mass marketed products offered to our residential subscribers. B2B non-subscription revenue includes revenue from business broadband internet, video, fixed-line telephony, mobile and data services offered to medium to large enterprises and, on a wholesale basis, to other operators.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2019, 2018 and 2017

- (e) Other revenue includes, among other items, (i) revenue earned from the JV Services and the sale of customer premises equipment to the VodafoneZiggo JV, (ii) revenue earned from transitional and other services provided to various third parties and (iii) broadcasting revenue in Ireland.

Geographic Segments

The revenue of our geographic segments is set forth below:

	Year ended December 31,		
	2019	2018	2017
	in millions		
U.K.	\$ 6,086.2	\$ 6,351.2	\$ 5,927.9
Belgium	2,893.0	2,993.6	2,865.3
Switzerland	1,258.8	1,326.0	1,370.1
Ireland	514.1	523.9	470.8
Poland	425.7	440.7	417.9
Slovakia	49.7	51.5	49.6
Other, including intersegment eliminations	314.0	271.0	174.8
Total	\$ 11,541.5	\$ 11,957.9	\$ 11,276.4
VodafoneZiggo JV (the Netherlands)	\$ 4,407.8	\$ 4,602.2	\$ 4,512.5

The long-lived assets of our geographic segments are set forth below:

	December 31,	
	2019	2018
	in millions	
U.K.	\$ 15,422.4	\$ 15,489.2
Belgium	5,910.3	5,979.4
Switzerland	4,247.7	4,165.4
Poland	937.0	958.7
Ireland	748.5	765.4
Slovakia	125.2	128.7
U.S. and other (a)	1,079.6	1,142.2
Total	\$ 28,470.7	\$ 28,629.0
VodafoneZiggo JV (the Netherlands)	\$ 20,674.8	\$ 22,026.2

- (a) Primarily relates to certain long-lived assets included in Central and Corporate.

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2019, 2018 and 2017

(21) Quarterly Financial Information (Unaudited)

	2019			
	1st quarter	2nd quarter	3rd quarter	4th quarter
	in millions, except per share amounts			
Revenue	\$ 2,868.0	\$ 2,850.4	\$ 2,840.9	\$ 2,982.2
Operating income	\$ 105.5	\$ 148.7	\$ 208.8	\$ 282.5
Earnings (loss) from continuing operations	\$ (306.9)	\$ (339.6)	\$ 587.2	\$ (1,349.7)
Net earnings (loss)	\$ 15.7	\$ 82.5	\$ 12,885.1	\$ (1,345.1)
Net earnings (loss) from continuing operations attributable to Liberty Global shareholders	\$ (315.6)	\$ (369.1)	\$ 550.0	\$ (1,391.1)
Net earnings (loss) attributable to Liberty Global shareholders	\$ 7.0	\$ 53.0	\$ 12,847.9	\$ (1,386.5)
Basic and diluted earnings (loss) from continuing operations attributable to Liberty Global shareholders per share (note 3)	\$ (0.43)	\$ (0.50)	\$ 0.77	\$ (2.20)
Basic earnings (loss) attributable to Liberty Global shareholders per share	\$ 0.01	\$ 0.07	\$ 17.99	\$ (2.19)
Diluted earnings (loss) attributable to Liberty Global shareholders per share	\$ 0.01	\$ 0.07	\$ 17.91	\$ (2.19)
	2018			
	1st quarter	2nd quarter	3rd quarter	4th quarter
	in millions, except per share amounts			
Revenue	\$ 3,063.5	\$ 3,015.6	\$ 2,929.7	\$ 2,949.1
Operating income	\$ 117.5	\$ 264.1	\$ 205.1	\$ 252.4
Earnings (loss) from continuing operations	\$ (1,367.2)	\$ 669.0	\$ (399.4)	\$ (313.9)
Net earnings (loss)	\$ (1,178.6)	\$ 950.5	\$ 1,025.9	\$ 52.2
Net earnings (loss) from continuing operations attributable to Liberty Global shareholders	\$ (1,373.3)	\$ 632.9	\$ (450.6)	\$ (341.0)
Net earnings (loss) attributable to Liberty Global shareholders	\$ (1,186.5)	\$ 912.6	\$ 974.1	\$ 25.1
Basic and diluted earnings (loss) from continuing operations attributable to Liberty Global shareholders per share (note 3)	\$ (1.70)	\$ 0.80	\$ (0.57)	\$ (0.45)
Basic earnings (loss) attributable to Liberty Global shareholders per share	\$ (1.47)	\$ 1.16	\$ 1.23	\$ 0.03
Diluted earnings (loss) attributable to Liberty Global shareholders per share	\$ (1.47)	\$ 1.15	\$ 1.23	\$ 0.03

LIBERTY GLOBAL PLC
Notes to Consolidated Financial Statements — (Continued)
December 31, 2019, 2018 and 2017

(22) Subsequent Events

Telenet Financing Transaction

In January 2020, Telenet entered into (i) a \$2,295.0 million U.S. dollar-denominated term loan facility and (ii) a €1,110.0 million (\$1,246.4 million) euro-denominated term loan facility, each under the Telenet Credit Facility. The net proceeds from these facilities, together with existing cash, were used to prepay in full (a) the \$2,295.0 million outstanding principal amount on a U.S. dollar-denominated term loan facility and (b) the €1,110.0 million outstanding principal amount on a euro-denominated term loan facility, each under the Telenet Credit Facility.

UPC Holding Financing Transaction

In January 2020, UPC Holding entered into (i) a \$700.0 million U.S. dollar-denominated term loan facility and (ii) a €400.0 million (\$449.1 million) euro-denominated term loan facility, each under the UPC Holding Bank Facility. The net proceeds from these facilities were used to prepay in full the \$1,140.0 million of outstanding principal amount on a U.S. dollar-denominated term loan facility under the UPC Holding Bank Facility, together with accrued and unpaid interest and the related prepayment premiums, which was owed to the applicable UPCB SPE and, in turn, the UPCB SPE used such proceeds to redeem in full the \$1,140.0 million outstanding principal amount of U.S. dollar-denominated notes under the UPCB SPE Notes.

PART III

The capitalized terms used in Part III of this Annual Report on Form 10-K are defined in the notes to our consolidated financial statements. In the following text, the terms, “we,” “our,” “our company” and “us” may refer, as the context requires, to Liberty Global or collectively to Liberty Global and its subsidiaries.

Except as indicated below, the following required information is incorporated by reference to our definitive proxy statement for our 2020 Annual Meeting of Shareholders, which we intend to hold during the second quarter of 2020.

- Item 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE
- Item 11. EXECUTIVE COMPENSATION
- Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required by Item 201(d) of Regulation S-K is included below and accordingly will not be incorporated by reference to our definitive proxy statement.

- Item 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE
- Item 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

We intend to file our definitive proxy statement for our 2020 Annual Meeting of Shareholders with the Securities and Exchange Commission on or before April 29, 2020.

Item 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED SHAREHOLDER MATTERS

Securities Authorized for Issuance Under Equity Compensation Plans

The following table sets forth information as of December 31, 2019 with respect to our ordinary shares that are authorized for issuance under our equity compensation plans.

Equity Compensation Plan Information

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (1)(2)	Weighted average exercise price of outstanding options, warrants and rights (1)(2)	Number of securities available for future issuance under equity compensation plans (excluding securities reflected in the first column)
Equity compensation plans approved by security holders:			
Liberty Global 2014 Incentive Plan (3):			
Total ordinary shares available for issuance			71,262,640
Liberty Global Class A ordinary shares	18,331,934	\$ 30.82	
Liberty Global Class C ordinary shares	36,771,970	\$ 29.83	
Liberty Global 2014 Nonemployee Director Incentive Plan (4):			
Total ordinary shares available for issuance			8,652,029
Liberty Global Class A ordinary shares	436,512	\$ 32.46	
Liberty Global Class C ordinary shares	1,250,046	\$ 29.60	
Liberty Global 2005 Incentive Plan (5):			
Liberty Global Class A ordinary shares	3,301,605	\$ 28.17	—
Liberty Global Class C ordinary shares	9,833,382	\$ 26.74	
Liberty Global 2005 Director Incentive Plan (5):			
Liberty Global Class A ordinary shares	86,759	\$ 23.09	—
Liberty Global Class C ordinary shares	268,664	\$ 22.05	
VM Incentive Plan (5):			
Liberty Global Class A ordinary shares	264,128	\$ 25.47	—
Liberty Global Class C ordinary shares	2,583,352	\$ 24.70	
Equity compensation plans not approved by security holders:			
None	—		—
Totals:			
Total ordinary shares available for issuance			79,914,669
Liberty Global Class A ordinary shares	22,420,938		
Liberty Global Class C ordinary shares	50,707,414		

- (1) This table includes (i) SARs and PSARs with respect to 17,761,064 and 4,071,616 Liberty Global Class A shares, respectively, and 39,057,614 and 8,143,232 Liberty Global Class C ordinary shares, respectively. Upon exercise, the appreciation of a SAR, which is the difference between the base price of the SAR and the then-market value of the respective underlying class of ordinary shares or in certain cases, if lower, a specified price, may be paid in shares of the applicable class of ordinary shares. Based upon the respective market prices of Liberty Global Class A and Class C ordinary shares at December 31, 2019, all of our outstanding SARs were out-of-the-money as of such date. For further information, see note 5 to our consolidated financial statements.
- (2) In addition to the option, SAR and PSAR information included in this table, there are outstanding RSU and PSU awards under the various incentive plans with respect to an aggregate of 3,962,826, 1,378,786 and 7,919,961, Liberty Global Class A, Liberty Global Class B and Liberty Global Class C ordinary shares, respectively.

- (3) The Liberty Global 2014 Incentive Plan permits grants of, or with respect to, Liberty Global Class A, Class B, or Class C ordinary shares subject to a single aggregate limit of 155 million shares (of which no more than 50.25 million shares may consist of Class B shares), subject to anti-dilution adjustments. As of December 31, 2019, an aggregate of 71,262,640 ordinary shares were available for issuance pursuant to the incentive plan. For further information, see note 15 to our consolidated financial statements.
- (4) The Liberty Global 2014 Nonemployee Director Incentive Plan permits grants of, or with respect to, Liberty Global Class A, Class B, or Class C ordinary shares subject to a single aggregate limit of 10.5 million shares, subject to anti-dilution adjustments. As of December 31, 2019, an aggregate of 8,652,029 ordinary shares were available for issuance pursuant to the Liberty Global 2014 Nonemployee Director Incentive Plan. For further information, see note 13 to our consolidated financial statements.
- (5) On January 30, 2014, our shareholders approved the Liberty Global 2014 Incentive Plan and the Liberty Global 2014 Nonemployee Director Incentive Plan and, accordingly, no further awards will be granted under the Liberty Global 2005 Incentive Plan, the Liberty Global 2005 Director Incentive Plan or the VM Incentive Plan.

PART IV

Item 15. EXHIBITS, FINANCIAL STATEMENT SCHEDULES

(a) (1) FINANCIAL STATEMENT

The financial statements required under this Item begin on page II-44 of this Annual Report on Form 10-K.

(a) (2) FINANCIAL STATEMENT SCHEDULES

The financial statement schedules required under this Item are as follows:

Schedule I - Condensed Financial Information of Registrant (Parent Company Information):

Liberty Global plc Condensed Balance Sheets as of December 31, 2019 and 2018 (Parent Company Only)	IV-8
Liberty Global plc Condensed Statements of Operations for the years ended December 31, 2019, 2018 and 2017 (Parent Company Only)	IV-9
Liberty Global plc Condensed Statements of Cash Flows for the years ended December 31, 2019, 2018 and 2017 (Parent Company Only)	IV-10

Schedule II - Valuation and Qualifying Accounts

[IV-11](#)

(a) (3) EXHIBITS

Listed below are the exhibits filed as part of this Annual Report on Form 10-K (according to the number assigned to them in Item 601 of Regulation S-K):

2 -- Plan of Acquisition, Reorganization, Arrangement, Liquidation or Succession:

- 2.1 [Reorganization Agreement, dated as of December 29, 2017, between Liberty Global plc and Liberty Latin America Ltd. \(incorporated by reference to Exhibit 2.1 to Liberty Latin America Ltd.'s Post-Effective Amendment No. 1 to its Registration Statement on Form S-1 filed on December 29, 2017 \(File No. 333-221608\)\).](#)
- 2.2 [Amended Sale and Purchase Agreement, dated as of May 9, 2018, as amended, by and among Liberty Global plc and Vodafone Group plc and certain of their respective subsidiaries \(incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on Form 8-K filed August 5, 2019 \(File No. 001-35961\)\).***](#)

3 -- Articles of Incorporation and Bylaws:

- 3.1 [Articles of Association of Liberty Global plc, effective as of July 1, 2015 \(incorporated by reference to Exhibit 3.1 to the Registrant's Registration Statement on Form 8-A filed June 19, 2015 \(File No. 001-35961\)\).](#)

4 -- Instruments Defining the Rights of Securities Holders, including Indentures:

- 4.1 [Description of the Registrant's Securities Registered Pursuant to Section 12 of the Securities Exchange Act of 1934.*](#)
- 4.2 [Amended Credit Agreement to Senior Secured Credit Facility Agreement originally dated January 16, 2004, dated November 29, 2017, among UPC Broadband Holding B.V. \(UPC Broadband Holding\) as Borrower, The Bank of Nova Scotia, as Facility Agent, the Guarantors listed therein, the Security Agent and the bank and financial institutions acceding thereto from time to time \(the UPC Broadband Holding Bank Facility\) \(incorporated by reference to Schedule 2 of Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 5, 2017 \(File No. 001-35961\)\(the December 2017\)\).](#)
- 4.3 [Supplemental Deed dated November 29, 2017, between UPC Broadband Holding, as Obligor, and the Bank of Nova Scotia as Facility Agent and Security Agent, which is supplemental to and amends the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.1 to the December 2017 8-K\).](#)
- 4.4 [Indenture dated April 15, 2015, among UPCB Finance IV Limited, The Bank of New York Mellon, London Branch as Trustee, Principal Paying Agent, Transfer Agent and Security Agent, The Bank of New York Mellon as New York Paying Agent, New York Transfer Agent and Dollar Notes Registrar and The Bank of New York Mellon \(Luxembourg\) S.A. as Euro Notes Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 21, 2015 \(File No. 001-35961\) \(the April 2015 8-K/A\)\).](#)
- 4.5 [Additional Facility AK Accession Agreement, dated April 15, 2015, among UPC Financing Partnership \(UPC Financing\) as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AK Lender, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.2 to the April 2015 8-K/A\).](#)

- 4.6 [Additional Facility AL Accession Agreement, dated April 15, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AL Lender, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.3 to the April 2015 8-K/A\).](#)
- 4.7 [Additional Facility AL2 Accession Agreement, dated May 20, 2015, among UPC Financing as Borrower, The Bank of New York Nova Scotia as Facility Agent and Security Agent, UPC Broadband Holding and UPCB Finance IV Limited as Additional Facility AL2 Lender, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed May 21, 2015 \(File No. 001-35961\)\).](#)
- 4.8 [Additional Facility AM Accession Agreement, dated August 3, 2015, among UPC Financing as Borrower, The Bank of Nova Scotia as Facility Agent and Security Agent and the financial institutions listed therein as Additional Facility AM Lenders, under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed August 6, 2015 \(File No. 001-35961\)\).](#)
- 4.9 [Additional Facility AQ Accession Agreement dated June 21, 2017 and entered into between, among others, UPC Financing and UPC Broadband Holding as borrowers and The Bank of Nova Scotia as Facility Agent and Security Agent and the financial institutions listed therein as Additional Facility AQ Lenders under the UPC Broadband Holding Bank Facility \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed June 27, 2017 \(File No. 001-35961\)\).](#)
- 4.10 [Additional Facility AT Accession Agreement dated January 31, 2020 and entered into between, among others, UPC Financing Partnership as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed on February 6, 2020 \(File No. 001-35961\) \(the February 6, 2020 8-K\).](#)
- 4.11 [Additional Facility AU Accession Agreement dated January 31, 2020 and entered into between, among others, UPC Broadband Holding B.V. as the Borrower and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.2 to the February 6, 2020 8-K\).](#)
- 4.12 [Additional Facility AN Accession Agreement dated May 24, 2018 and entered into between, among others, Telenet Financing USD LLC as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed May 31, 2018 \(File No. 001-35961\)\(the May 2018 8-K\).](#)
- 4.13 [Additional Facility AR Accession Agreement dated January 24, 2020 and entered into between, among others, Telenet Financing USD LLC as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed January 30, 2020 \(File No. 001-35961\) \(the January 30, 2020 8-K\).](#)
- 4.14 [Additional Facility AQ Accession Agreement dated January 24, 2020 and entered into between, among others, Telenet International Finance S.à.r.l. as the Borrower, Telenet BVBA as a Guarantor and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.2 to the January 30, 2020 8-K\).](#)
- 4.15 [Additional Facility AP Accession Agreement dated May 24, 2019 and entered into between, among others, Telenet International Finance S.à.r.l. as the Borrower, the Guarantors listed therein and The Bank of Nova Scotia as the Facility Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed May 30, 2019 \(File No. 001-35961\)\).](#)
- 4.16 [Indenture dated December 13, 2017 between Telenet Finance Luxembourg Notes S.a.r.l., The Bank of New York Mellon, London Branch, as Trustee and Security Trustee and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Transfer Agent and Registrar \(incorporated by reference to Exhibit 4.4 to the Registrant's Current Report on Form 8-K filed December 18, 2017 \(File No. 000.35961\)\(the December 2017 8-K/A\)\).](#)
- 4.17 [Additional Facility AJ Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent \(incorporated by reference to Exhibit 4.5 to the December 2017 8-K/A\).](#)
- 4.18 [Additional Facility AK Accession Agreement dated December 13, 2017 and entered into between, among others, Telenet International Finance S.a.r.l. as the Borrower, Telenet Financing USD LLC as a Guarantor, The Bank of Nova Scotia as Facility Agent and KBC Bank NV as Security Agent \(incorporated by reference to Exhibit 4.6 to the December 2017 8-K/A\).](#)
- 4.19 [Telenet Supplemental Agreement \(Credit Agreement\) dated November 16, 2018 between among others, Telenet BVBA as the company, The Bank of Nova Scotia as facility agent and KBC Bank NV as security agent \(incorporated by reference to Exhibit 4.1 to the November 2018 8-K \).](#)
- 4.20 [Indenture dated March 28, 2014 between Virgin Media Secured Finance PLC, The Bank of New York Mellon, London Branch, as Trustee, Transfer Agent and Principal Paying Agent, The Bank of New York Mellon as Paying Agent, and The Bank of New York Mellon \(Luxembourg\) S.A., as Registrar \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed April 3, 2014 \(File No. 001-35961\)\).](#)

- 4.21 [Indenture dated January 28, 2015 between Virgin Media Finance PLC, The Bank of New York Mellon, London Branch, as Trustee and Principal Paying Agent, The Bank of Mellon as Paying Agent and Dollar Notes Transfer Agent and Registrar and The Bank of New York Mellon \(Luxembourg\) S.A., as Euro Notes Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.2 to the February 2015 8-K/A\).](#)
- 4.22 [Additional L Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional L Facility Lender under the VMF Senior Facilities Agreement \(incorporated by reference to Exhibit 4.2 to the November 2017 8-K\).](#)
- 4.23 [Additional M Facility Accession Deed dated November 10, 2017, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional M Facility Lender under the VMF Senior Facilities Agreement \(incorporated by reference to Exhibit 4.3 to the November 2017 8-K\).](#)
- 4.24 [Additional N Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media Bristol LLC as the Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional N Facility Lender \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed October 10, 2019 \(File No. 001-35961\)\) \(the October 10, 2019 8-K\).](#)
- 4.25 [Additional O Facility Accession Deed dated October 4, 2019, between Virgin Media Investment Holdings Limited as the Company, Virgin Media SFA Finance Limited as the Facility O Borrower, The Bank of Nova Scotia as the Facility Agent and The Bank of Nova Scotia as Additional O Facility Lender \(incorporated by reference to Exhibit 4.2 to the October 10, 2019 8-K\).](#)
- 4.26 [Amendment and Restatement Agreement dated December 9, 2019 between Virgin Media Investment Holdings Limited \(for itself and as agent on behalf of the other obligors\) and The Bank of Nova Scotia \(as facility agent\), and attached as a schedule thereto, a copy of the Senior Facilities Agreement, originally dated June 7, 2013, between, among others, Virgin Media Investment Holdings Limited as a borrower and a guarantor, The Bank of Nova Scotia as facility agent and Deutsche Bank AG, London Branch as security trustee as amended and restated by the Amendment and Restatement Agreement \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed December 13, 2019 \(File No. 001-35961\)\).](#)
- 4.27 [Indenture dated May 16, 2019, among Virgin Media Secured Finance PLC, as Issuer, BNY Mellon Corporate Trustee Services Limited as Trustee, The Bank of New York Mellon, London Branch, as Principal Paying Agent and The Bank of New York Mellon SA/NV, Luxembourg Branch, as Registrar and Transfer Agent \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K/A filed May 17, 2019 \(File No. 001-35961\)\).](#)
- 4.28 [Supplemental Indenture, dated as of July 5, 2019, between Virgin Media Secured Finance PLC as Issuer and BNY Mellon Corporate Trustee Services Limited as Trustee, to the Indenture dated May 16, 2019 for 5.50% Senior Secured Notes and 5.25% Senior Secured Notes, each due 2029 \(incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed July 9, 2019 \(File No. 001-35961\)\).](#)
- 4.29 [SFA/ICA Accession Deed dated October 21, 2019, among UPC Poland Holding B.V., UPC Polska Sp. z o. o., UPC Poland Property Sp. z o. o., Liberty Global Europe Holdco 2 B.V., and The Bank of Nova Scotia as the Facility Agent and Security Agent, to the Amended Credit Agreement to Senior Secured Credit Facility Agreement originally dated January 16, 2004 \(as amended and restated from time to time, including the Supplemental Deed dated November 29, 2017\) \(incorporated by reference to Exhibit 4.6 to the Registrant's Quarterly Report on Form 10-Q filed November 6, 2019 \(File No. 001-35961\)\) \(the November 2019 10-Q\)\).](#)

The Registrant undertakes to furnish to the Securities and Exchange Commission, upon request, a copy of all instruments with respect to long-term debt not filed herewith.

10 -- Material Contracts:

- 10.1 [Deed of Assumption of Liberty Global plc, dated June 7, 2013 \(incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed June 7, 2013 \(File No. 001-35961\)\)\(the June 7, 2013 8-K\).](#)
- 10.2 [Liberty Global 2014 Incentive Plan \(Amended and Restated effective June 11, 2019 \(as amended and restated from time to time, the Incentive Plan\) \(incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2019 \(File No. 001-35961\)\) \(the August 2019 10-Q\)\).](#)
- 10.3 [Liberty Global 2014 Nonemployee Director Incentive Plan Effective March 1, 2014 \(the Director Plan\) \(incorporated by reference to Appendix B to the Registrant's Proxy Statement on Schedule 14A filed December 19, 2013 \(File No. 001-35961\)\).](#)
- 10.4 [Form of Non-Qualified Share Option Agreement under the Director Plan \(incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q filed August 5, 2014 \(File No. 001-35961\)\) \(the August 5, 2014 10-Q\)\).](#)
- 10.5 [Form of Restricted Share Units Agreement under the Director Plan \(incorporated by reference to Exhibit 10.4 to the August 5, 2014 10-Q\).](#)
- 10.6 [Liberty Global, Inc. 2005 Incentive Plan \(as amended and restated effective June 7, 2013\) \(the 2005 Incentive Plan\) \(incorporated by reference to Exhibit 10.2 to the June 7, 2013 8-K\).](#)
- 10.7 [Liberty Global, Inc. 2005 Nonemployee Director Incentive Plan \(as amended and restated effective June 7, 2013\) \(the 2005 Director Plan\) \(incorporated by reference to Exhibit 10.3 to the June 7, 2013 8-K\).](#)

- 10.8 [Virgin Media 2010 Stock Incentive Plan \(as amended and restated effective June 7, 2013\) \(incorporated by reference to Exhibit 10.4 to the June 7, 2013 8-K\).](#)
- 10.9 [Form of Non-Qualified Share Option Agreement under the 2005 Director Plan \(incorporated by reference to Exhibit 10.6 to the Registrant's Quarterly Report on Form 10-Q filed August 1, 2013 \(File No. 001-35961\)\).](#)
- 10.10 [Liberty Global Compensation Policy for Nonemployee Directors effective June 21, 2017 \(incorporated by reference to Appendix A to the Registrant's Proxy Statement on Schedule 14A filed May 1, 2017 \(File No. 001-35961\)\).](#)
- 10.11 [Form of Deed of Indemnity between Liberty Global and its Directors and Executive Officers \(incorporated by reference to Exhibit 10.10 to the June 7, 2013 8-K\).](#)
- 10.12 [Form of Stock Appreciation Rights Agreement under the 2005 Incentive Plan \(incorporated by reference to Exhibit 10.3 to Liberty Global, Inc.'s \(LGI\) Quarterly Report on Form 10-Q filed May 7, 2008 \(File No. 000-51360\)\).](#)
- 10.13 [Form of Performance Share Units Agreement for executive officers under the Incentive Plan \(incorporated by reference to Exhibit 10.16 to the Registrant's Annual Report on Form 10-K filed February 27, 2019 and amended on Form 10-K/A filed March 27, 2019 \(File No. 001-35961\)\) \(the 2019 10-K\).](#)
- 10.14 [Liberty Global 2017 Annual Performance Award Program for executive officers under the Incentive Plan \(description of said program is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed February 27, 2017 \(File No. 001-35961\)\(the February 2017 8-K\).](#)
- 10.15 [Liberty Global 2017 Compensatory Awards for certain executive officers under the Incentive Plan \(description of said awards is incorporated by reference to the description thereof included in Item 5.02\(e\) of the February 2017 8-K\).](#)
- 10.16 [Liberty Global 2018 Annual Performance Award Program for executive officers under the Incentive Plan \(description of said program is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed February 27, 2018 \(File No. 000-35961\)\).](#)
- 10.17 [Liberty Global 2018 Performance Incentive Plan for executive officers under the Incentive Plan \(a description of said plan is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed March 21, 2018 \(File No. 000-35961\)\).](#)
- 10.18 [Liberty Global 2019 Annual Performance Award Program for executive officers under the Incentive Plan \(description of said program is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed February 27, 2019 \(File No. 001-35961\)\).](#)
- 10.19 [Liberty Global 2019 Challenge Performance Award program for senior management, including our executive officers under the Incentive Plan \(a description of said program is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed March 13, 2019 \(File No. 001-35961\)\).](#)
- 10.20 [Liberty Global 2019 Performance Incentive Plan for executive officers under the Incentive Plan \(a description of said plan is incorporated by reference to the description thereof included in Item 5.02\(e\) of the Registrant's Current Report on Form 8-K filed April 5, 2019 \(File No. 001-35961\)\).](#)
- 10.21 [Deferred Compensation Plan \(adopted effective December 15, 2008; Amended and Restated as of October 26, 2015\)\(incorporated by reference to Exhibit 10.29 to the Registrant's Annual Report on Form 10-K filed February 16, 2016 \(File No. 001-35961\) \(the 2016 10-K\)\).](#)
- 10.22 [Nonemployee Director Deferred Compensation Plan \(As Amended and Restated Effective December 11, 2015\)\(incorporated by reference to Exhibit 10.30 to the 2016 10-K\).](#)
- 10.23 [Personal Usage of Aircraft Policy, restated June 7, 2013 \(incorporated by reference to Exhibit 10.31 to the 2016 10-K\).](#)
- 10.24 [Form of Aircraft Time Sharing Agreement \(7X\) \(incorporated by reference to Exhibit 10.29 to LGI's Annual Report on Form 10-K filed February 13, 2013 \(File No. 000-51360\)\).](#)
- 10.25 [Form of Share Appreciation Rights Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the August 4, 2016 10-Q\).](#)
- 10.26 [Executive Service Agreement, dated December 15, 2004, between UPC Services Limited and Charles Bracken \(incorporated by reference to Exhibit 10.36 to LGI's Annual Report on Form 10-K filed February 24, 2010 \(File No. 000-51360\)\).](#)
- 10.27 [Settlement Agreement dated as of January 15, 2019, by and between Liberty Global B.V. and Diederik Karsten \(incorporated by reference to Exhibit 10.31 to the 2019 10-K\).](#)
- 10.28 [Employment Agreement dated as of June 28, 2018, between LGI and Enrique Rodriguez \(incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q filed August 8, 2018 \(File No. 001-35961\)\).](#)
- 10.29 [Form of Performance Share Appreciation Rights Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the August 2019 10-Q\).](#)
- 10.30 [Form of Performance Restricted Share Units Agreement \(SHIP\) under the Incentive Plan \(incorporated by reference to Exhibit 10.4 to the August 2019 10-Q\).](#)
- 10.31 [Form of Share Appreciation Rights Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.5 to the August 2019 10-Q\).](#)

- 10.32 [Form of Performance Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.7 to the August 2019 10-Q\).](#)
- 10.33 [Form of Performance Share Units Agreement between the Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.8 to the August 2019 10-Q\).](#)
- 10.34 [Amended and Restated Employment Agreement dated as of April 30, 2019, by and among the Registrant, Liberty Global Inc. and Michael T. Fries \(incorporated by reference to Exhibit 10.9 to the August 2019 10-Q\).](#)
- 10.35 [Form of Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.1 to the November 2019 10-Q\).](#)
- 10.36 [Form of Performance Share Appreciation Rights Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.2 to the November 2019 10-Q\).](#)
- 10.37 [Form of Restricted Share Units Agreement \(SHIP\) under the Incentive Plan \(incorporated by reference to Exhibit 10.6 to the November 2019 10-Q\).](#)
- 10.38 [Form of Restricted Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.3 to the November 2019 10-Q\).](#)
- 10.39 [Form of Performance Restricted Share Units Agreement under the Incentive Plan \(incorporated by reference to Exhibit 10.4 to the November 2019 10-Q\).](#)
- 10.40 [Form of Performance Restricted Share Units Agreement between Registrant and our Chief Executive Officer under the Incentive Plan \(incorporated by reference to Exhibit 10.5 to the November 2019 10-Q\).](#)
- 10.41 [Trade Mark Licence, dated as of April 3, 2006, between Virgin Enterprises Limited and NTL Group Limited \(incorporated by reference to Exhibit 10.2 to Virgin Media's Quarterly Report on Form 10-Q filed August 9, 2006 \(File No. 000-50886\)\).](#)
- 10.42 [Amendment Letter No. 1, dated February 8, 2007, to the Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated April 3, 2006 \(incorporated by reference to Exhibit 10.5 to Virgin Media's Quarterly Report on Form 10-Q filed August 8, 2007 \(File No. 000-50886\)\).](#)
- 10.43 [Amendment Letter No. 2, dated October 1, 2007, to the Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated April 3, 2006 \(incorporated by reference to Exhibit 10.6 to Virgin Media's Quarterly Report on Form 10-Q filed November 8, 2007 \(File No. 000-50886\)\).](#)
- 10.44 [Trade Mark Licence between Virgin Enterprises Limited and Virgin Media Limited dated December 16, 2009 \(incorporated by reference to Exhibit 10.83 to Virgin Media's Annual Report on Form 10-K filed February 26, 2010 \(File No. 000-50886\)\).](#)
- 10.45 [Amended and Restated Contribution and Transfer Agreement, dated July 21, 2016, as amended and restated December 31, 2016, by and among, Liberty Global Europe Holding B.V., the Registrant, Vodafone International Holdings B.V., Vodafone Group Plc and Lynx Global Europe II B.V. \(incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed January 6, 2017 \(File No. 001-35961\)\(the January 2017 8-K\)\).](#)
- 10.46 [Shareholders' Agreement, dated December 31, 2016, by and among, Vodafone International Holdings B.V., Vodafone Group Plc, Liberty Global Europe Holding B.V., the Registrant and Lynx Global Europe II B.V. \(incorporated by reference to Exhibit 10.2 to the January 2017 8-K\).](#)

[21 -- List of Subsidiaries*](#)

23 -- Consent of Experts and Counsel:

- 23.1 [Consent of KPMG LLP*](#)

31 -- Rule 13a-14(a)/15d-14(a) Certification:

- 31.1 [Certification of President and Chief Executive Officer*](#)
- 31.2 [Certification of Executive Vice President and Chief Financial Officer \(Principal Financial Officer\)*](#)

[32 -- Section 1350 Certification **](#)

101.SCH	Inline XBRL Taxonomy Extension Schema Document*
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document*
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase*
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document*
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document*
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)*

* Filed herewith

** Furnished herewith

*** Schedules and similar attachments to the agreement have been omitted pursuant to Item 601(a)(5) of Regulation S-K. The Registrant hereby undertakes to furnish supplemental copies of any of the omitted schedules and similar attachments upon request by the United States Securities and Exchange Commission

**Item 16. FORM 10-K
SUMMARY**

None.

SIGNATURES

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

LIBERTY GLOBAL PLC

Dated: February 13, 2020

/s/ BRYAN H. HALL

Bryan H. Hall
Executive Vice President, General Counsel and Secretary

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the date indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ JOHN C. MALONE</u> John C. Malone	Chairman of the Board	February 13, 2020
<u>/s/ MICHAEL T. FRIES</u> Michael T. Fries	President, Chief Executive Officer and Director	February 13, 2020
<u>/s/ ANDREW J. COLE</u> Andrew J. Cole	Director	February 13, 2020
<u>/s/ MIRANDA CURTIS</u> Miranda Curtis	Director	February 13, 2020
<u>/s/ JOHN W. DICK</u> John W. Dick	Director	February 13, 2020
<u>/s/ PAUL A. GOULD</u> Paul A. Gould	Director	February 13, 2020
<u>/s/ RICHARD R. GREEN</u> Richard R. Green	Director	February 13, 2020
<u>/s/ DAVID E. RAPLEY</u> David E. Rapley	Director	February 13, 2020
<u>/s/ LARRY E. ROMRELL</u> Larry E. Romrell	Director	February 13, 2020
<u>/s/ J.C. SPARKMAN</u> J.C. Sparkman	Director	February 13, 2020
<u>/s/ J. DAVID WARGO</u> J. David Wargo	Director	February 13, 2020
<u>/s/ CHARLES H.R. BRACKEN</u> Charles H.R. Bracken	Executive Vice President and Chief Financial Officer	February 13, 2020
<u>/s/ JASON WALDRON</u> Jason Waldron	Senior Vice President and Chief Accounting Officer	February 13, 2020

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED BALANCE SHEETS
(Parent Company Only)

	December 31,	
	2019	2018
	in millions	
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 6.7	\$ 10.8
Other receivables — related-party	68.9	13.0
Other current assets	80.6	7.0
Total current assets	156.2	30.8
Long-term notes receivable — related-party	2,984.9	1,215.5
Investments in consolidated subsidiaries, including intercompany balances	33,570.7	20,829.5
Other assets, net	266.1	13.7
Total assets	<u>\$ 36,977.9</u>	<u>\$ 22,089.5</u>
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	\$ 0.5	\$ 3.5
Other payables — related-party	22.5	26.4
Current portion of notes payable — related-party	7,575.4	3,033.3
Accrued liabilities and other	12.6	9.1
Total current liabilities	7,611.0	3,072.3
Long-term notes payable — related-party	15,757.2	14,332.5
Other long-term liabilities	3.5	3.3
Total liabilities	23,371.7	17,408.1
Commitments and contingencies		
Shareholders' equity:		
Liberty Global Shares — Class A, \$0.01 nominal value. Issued and outstanding 181,560,735 and 204,450,499 shares, respectively	1.8	2.0
Liberty Global Shares — Class B, \$0.01 nominal value. Issued and outstanding 12,151,526 and 11,099,593 shares, respectively	0.1	0.1
Liberty Global Shares — Class C, \$0.01 nominal value. Issued and outstanding 438,867,447 and 531,174,389 shares, respectively	4.4	5.3
Additional paid-in capital	6,136.9	9,214.5
Accumulated earnings (deficit)	6,350.4	(5,172.2)
Accumulated other comprehensive earnings, net of taxes	1,112.7	631.8
Treasury shares, at cost	(0.1)	(0.1)
Total shareholders' equity	13,606.2	4,681.4
Total liabilities and shareholders' equity	<u>\$ 36,977.9</u>	<u>\$ 22,089.5</u>

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF OPERATIONS
(Parent Company Only)

	Year ended December 31,		
	2019	2018	2017
	in millions		
Operating costs and expenses:			
Selling, general and administrative (including share-based compensation)	\$ 61.0	\$ 42.8	\$ 44.9
Related-party fees and allocations	20.6	8.0	55.2
Depreciation and amortization	1.4	1.5	1.0
Other operating expenses	0.2	—	—
Operating loss	<u>(83.2)</u>	<u>(52.3)</u>	<u>(101.1)</u>
Non-operating income (expense):			
Interest expense — related-party	(864.6)	(678.0)	(406.5)
Interest income — related-party	89.6	70.9	822.7
Foreign currency transaction gains (losses), net	281.2	381.0	(644.8)
Other income (expense), net	3.4	0.1	(3.3)
	<u>(490.4)</u>	<u>(226.0)</u>	<u>(231.9)</u>
Loss before income taxes and equity in earnings (losses) of consolidated subsidiaries, net	(573.6)	(278.3)	(333.0)
Equity in earnings (losses) of consolidated subsidiaries, net	11,921.4	887.9	(2,386.0)
Income tax benefit (expense)	173.6	115.7	(59.1)
Net earnings (loss)	<u>\$ 11,521.4</u>	<u>\$ 725.3</u>	<u>\$ (2,778.1)</u>

LIBERTY GLOBAL PLC
SCHEDULE I
(Parent Company Information - See Notes to Consolidated Financial Statements)
CONDENSED STATEMENTS OF CASH FLOWS
(Parent Company Only)

	Year ended December 31,		
	2019	2018	2017
	in millions		
Cash flows from operating activities:			
Net earnings (loss)	\$ 11,521.4	\$ 725.3	\$ (2,778.1)
Adjustments to reconcile net earnings (loss) to net cash provided (used) by operating activities:			
Equity in losses (earnings) of consolidated subsidiaries, net	(11,921.4)	(887.9)	2,386.0
Share-based compensation expense	35.8	20.6	19.8
Related-party fees and allocations	20.6	8.0	55.2
Depreciation and amortization	1.4	1.5	1.0
Other operating expenses	0.2	—	—
Foreign currency transaction losses (gains), net	(281.2)	(381.0)	644.8
Deferred income tax benefit	(10.0)	(2.8)	(1.6)
Changes in operating assets and liabilities:			
Receivables and other operating assets	(213.7)	(134.8)	502.7
Payables and accruals	554.3	564.4	(160.9)
Net cash provided (used) by operating activities	<u>(292.6)</u>	<u>(86.7)</u>	<u>668.9</u>
Cash flows from investing activities:			
Distribution and repayments from (investments in and advances to) consolidated subsidiaries, net	(142.8)	(93.4)	1,188.7
Funding of the Vodafone Escrow Accounts, net	(295.2)	—	—
Other investing activities, net	(0.1)	—	(7.0)
Net cash provided (used) by investing activities	<u>(438.1)</u>	<u>(93.4)</u>	<u>1,181.7</u>
Cash flows from financing activities:			
Borrowings of related-party debt	5,870.5	3,133.3	4,632.7
Repayments of related-party debt	(2,018.6)	(1,010.0)	(3,496.0)
Repurchase of Liberty Global ordinary shares	(3,219.4)	(2,009.9)	(2,976.2)
Borrowings of third-party debt	98.6	—	—
Other financing activities, net	(5.0)	4.3	3.6
Net cash provided (used) by financing activities	<u>726.1</u>	<u>117.7</u>	<u>(1,835.9)</u>
Effect of exchange rate changes on cash	0.5	—	(0.4)
Net increase (decrease) in cash and cash equivalents	(4.1)	(62.4)	14.3
Cash and cash equivalents:			
Beginning of period	16.0	78.4	64.1
End of period	<u>\$ 11.9</u>	<u>\$ 16.0</u>	<u>\$ 78.4</u>
Details of end of period cash and cash equivalents and restricted cash:			
Cash and cash equivalents	\$ 6.7	\$ 10.8	\$ 73.2
Restricted cash included in other current assets	5.2	5.2	5.2
Total cash and cash equivalents and restricted cash	<u>\$ 11.9</u>	<u>\$ 16.0</u>	<u>\$ 78.4</u>

LIBERTY GLOBAL PLC
SCHEDULE II
VALUATION AND QUALIFYING ACCOUNTS

Allowance for doubtful accounts — Trade receivables (Continuing operations)

	Balance at beginning of period	Impact of the adoption of ASU 2014-09	Additions to costs and expenses	Acquisitions	Deductions or write-offs	Foreign currency translation adjustments	Balance at end of period
in millions							
Year ended December 31:							
2017	\$ 56.1	—	51.6	1.5	(41.7)	6.7	\$ 74.2
2018	\$ 74.2	11.9	61.6	—	(98.4)	(3.5)	\$ 45.8
2019	\$ 45.8	—	44.6	—	(48.3)	0.7	\$ 42.8

**DESCRIPTION OF THE REGISTRANT'S SECURITIES
REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES
EXCHANGE ACT OF 1934**

As of the end of the period covered by the most recent Annual Report on Form 10-K of Liberty Global plc (**Liberty Global, we or our Company**), our Company had three classes of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended (the **Exchange Act**): (1) Liberty Global Class A Ordinary Shares, par value \$0.01 per share (the **Liberty Global Class A Ordinary Shares**), (2) Liberty Global Class B Ordinary Shares, par value \$0.01 per share (the **Liberty Global Class B Ordinary Shares**) and (3) Liberty Global Class C Ordinary Shares, par value \$0.01 per share (the **Liberty Global Class C Ordinary Shares**, and together with the Liberty Global Class A Ordinary Shares and the Liberty Global Class B Ordinary Shares, the **Liberty Global Ordinary Shares**).

Description of Our Company's Ordinary Shares

The following description of the Liberty Global Class A Ordinary Shares, Liberty Global Class B Ordinary Shares, and Liberty Global Class C Ordinary Shares is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to our Company's [articles of association](#) (the **articles**), which is an exhibit to this Annual Report on Form 10-K and incorporated by reference herein. We encourage you to read the articles along with the applicable provisions of England and Wales law affecting corporations or companies and their shareholders for additional information.

Basic Investment

Liberty Global Ordinary Shares reflect the performance of all of our businesses. Holders of Liberty Global Ordinary Shares are holders of ordinary shares in our Company and, as such, are subject to all risks associated with an investment in Liberty Global and all of its businesses, assets and liabilities.

Sources of Dividends

Under English law, we cannot pay dividends in respect of the Liberty Global Ordinary Shares unless Liberty Global has sufficient available distributable reserves (defined as accumulated, realized profits less accumulated, realized losses) to do so and the assets of our Company are not, and following the dividend will not be, less than the aggregate of its issued and called-up share capital and undistributable reserves.

In addition to these English law restrictions, pursuant to a dividend policy previously adopted by our shareholders, our board of directors will not approve any cash dividend in respect of the Liberty Global Ordinary Shares unless the amount of dividend to be paid does not exceed either (i) an amount equal to the net assets of our Company over the nominal value of the Liberty Global Ordinary Shares or (ii) if there is no such excess, an amount equal to our Company's net earnings for the fiscal year in which such date occurs and/or the preceding fiscal year.

Declaration of Dividends

Following the recommendation of the board of directors, the shareholders may declare dividends by ordinary resolution, except that no dividend may exceed the amount recommended by our board of directors. Furthermore, our articles also provide that a general meeting declaring a dividend may, upon recommendation by our board of directors, direct by ordinary resolution that the dividend shall be satisfied wholly or partly by the distribution of assets, including (without limitation) paid up shares, debentures or securities of another corporation. Moreover, our directors are authorized to declare interim dividends (including wholly or partly by the distribution of assets) if our board of directors considers that they are justified by the profits of Liberty Global available for distribution.

Each class of Liberty Global Ordinary Shares ranks equally in the capital of our Company with all other classes of Liberty Global Ordinary Shares for any dividend declared or in respect of the capitalization of profits, in favor of the Liberty Global Ordinary Shares.

The provisions relating to dividends are subject to the more specific provisions relating to dividends paid in securities of another corporation described under “— *Securities Distributions*.”

Securities Distributions

Dividends paid in securities of another corporation are subject to the provisions governing dividends generally, as described above.

In addition, if a distribution includes securities issued by another corporation, unless otherwise recommended by three-quarters of our board of directors and approved by an ordinary resolution of the Liberty Global Class A Ordinary Shares and Liberty Global Class B Ordinary Shares, which we collectively refer to as the **Liberty Global Voting Shares**, voting together as a single class, these securities must be distributed on the basis that:

(1) the holders of Liberty Global Class A Ordinary Shares, Liberty Global Class B Ordinary Shares and Liberty Global Class C Ordinary Shares receive the identical class of securities, on an equal per share basis; or

(2) the holders of Liberty Global Class A Ordinary Shares, Liberty Global Class B Ordinary Shares and Liberty Global Class C Ordinary Shares each receive a different class of securities or the holders of one or more classes of Liberty Global Ordinary Shares each receive a different class of securities than the holders of all other classes of Liberty Global Ordinary Shares (in which cases: (i) the holders of Liberty Global Class B Ordinary Shares shall receive the securities having higher value voting rights and the holders of Liberty Global Class A Ordinary Shares and Liberty Global Class C Ordinary Shares will receive the securities having lower value voting rights, and (ii) if different classes of securities are being distributed to holders of the Liberty Global Class A Ordinary Shares and the Liberty Global Class C Ordinary Shares, then such securities shall be distributed either as determined by our board of directors or such that the relative voting rights of the class of securities to be received by the holders of Liberty Global Class A Ordinary Shares and Liberty Global Class C Ordinary Shares corresponds, to the extent practicable, to the relative voting rights of each such class of shares), on an equal per share basis.

Scrip Dividends

Our board of directors may offer any shareholder the right to elect to receive fully paid shares instead of cash in respect of the whole or some part (to be determined by our board of directors) of all or any dividend. In that case, each shareholder is only entitled to new shares (as our board of directors may determine) of either the identical class to which the dividend relates or Liberty Global Class C Ordinary Shares.

Bonus Issues

Subject to the U.K. Companies Act 2006 (the **Companies Act**), our board of directors has the authority to capitalize certain undistributed profits of our Company, our Company’s share premium account, and certain other reserves for the purpose of issuing shares or other securities of our Company to shareholders in a so-called “bonus issue.” Unless recommended by three-quarters of our board of directors and approved by an ordinary resolution of the Liberty Global Voting Shares, voting together as single class, our board of directors may only declare bonus issues:

(1) consisting of Liberty Global Class C Ordinary Shares to all holders of Liberty Global Ordinary Shares, on an equal per share basis;

(2) consisting of the identical class of Liberty Global Ordinary Shares held by each shareholder to holders of each class of Liberty Global Ordinary Shares, on an equal per share basis; or

(3) consisting of any other class of our securities to all holders of Liberty Global Ordinary Shares, on the basis referred to above for distributions of securities issued by another corporation. See “— *Securities Distributions*.”

Redesignation at Option of Holder

Each Liberty Global Class B Ordinary Share may be redesignated, or converted, at any time at the election of the holder into a Liberty Global Class A Ordinary Share.

Redesignation at Option of Issuer

We cannot redesignate, or convert, any Liberty Global Ordinary Shares.

Alteration of Share Capital

Subject to the provisions of the Companies Act, and without prejudice to any relevant special rights attached to any class of shares, Liberty Global may, from time to time:

- increase its share capital by allotting and issuing new shares;
- consolidate and divide all or any of its share capital into shares of a larger nominal value than the existing shares;
- cancel any of its shares;
- subdivide any of its shares into shares of a smaller nominal value than its existing shares;
- determine that, as between the shares resulting from such a subdivision, any of them may have any preference or advantage as compared with the others; and
- redenominate its share capital or any class of share capital.

In addition, our board of directors has the authority to effect one or more consolidations and/or subdivisions, on any ratio that our board of directors may determine in its sole and absolute discretion, of any or all of our shares. We believe that having this flexibility is useful for our board of directors in managing our capital structure in compliance with applicable English law requirements.

In addition, we may not consolidate, divide, sub-divide or redenominate any one or more Liberty Global Ordinary Shares without consolidating, dividing, sub-dividing or redenominating (as the case may be) all of the Liberty Global Ordinary Shares, on an equal per share basis.

Voting Rights

General. Each Liberty Global Class A Ordinary Share has one vote, each Liberty Global Class B Ordinary Share has ten votes, and each Liberty Global Class C Ordinary Share is non-voting, except where otherwise required by English law or our articles of association.

Variation of Class Rights. The rights attached to a class of shares may only be varied: (i) in such manner (if any) as may be provided by those rights; (ii) with the written consent of the holders of three-quarters in nominal value of the issued shares of that class (excluding any shares of that class held as treasury shares); or (iii) with the sanction of a special resolution passed at a separate meeting of the holders of the shares of that class, provided that, where the rights attached to more than one class of ordinary shares are, in the good faith opinion of three-quarters of our board of directors, varied or abrogated in a manner which has the same, or substantially the same, economic impact or effect, such shares shall together comprise a single class for the purposes of convening a separate meeting of holders of shares of a class with the voting rights set forth in Article 71 of our articles.

The following will be deemed not to vary the rights attached to any class of shares, unless expressly provided by the rights attached to such shares: the issue of further shares ranking pari passu with, or subsequent to, the relevant share or class of shares, the purchase or redemption by our Company of our own shares, or the exercise by our board of directors of its authority under certain provisions of our articles relating to dividends and securities distributions, scrip dividends, and bonus issues, all as further described above.

Amendment of Articles. Under English law, any amendment to our articles requires a special resolution of our Company in which all classes of our voting ordinary shares vote together as one class. This is in addition to any separate class vote that may be required for an amendment that varies the rights attached to shares of a particular class.

Liquidation

In the event of a liquidation, dissolution or winding-up of our Company, whether voluntary or involuntary, after payment or provision for payment of our debts and liabilities and, subject to the prior payment in full of any preferential amounts to which holders of our preference shares may be entitled, the holders of Liberty Global Class A Ordinary Shares, Liberty Global Class B Ordinary Shares and Liberty Global Class C Ordinary Shares will share equally, on a share for share basis, in our assets remaining for distribution to the holders of our ordinary shares.

In the event of a liquidation, the liquidator may, with the sanction of a special resolution and any other sanction required by law, divide among our shareholders the whole or any part of the assets of our Company, whether or not the assets consist of property of the same kind or not, and may, for that purpose, value any assets as he deems fair and determine how the division shall be carried out as among the holders of Liberty Global Class A Ordinary Shares, Liberty Global Class B Ordinary Shares and Liberty Global Class C Ordinary Shares. The liquidator may also, with the same authority, transfer the whole or any part of the assets to trustees upon any trusts for the benefit of the shareholders as the liquidator decides. No past or present shareholder can be compelled to accept any asset which could subject him or her to a liability.

Allotment Authority

Our board of directors is authorized, for a period up to five years from June 11, 2019, to allot and issue equity securities, or to grant rights to subscribe for or to convert or exchange any security into shares of Liberty Global up to an aggregate nominal amount of \$20,000,000. We refer to this as the “2019 general authority.” The 2019 general authority will expire on June 10, 2024. We intend to seek shareholder approval to give our board the same general authority with respect to the foregoing at our relevant future annual general meetings of shareholders.

Pre-Emption Rights

There are no rights of pre-emption under our articles in respect of transfers of shares by shareholders. In certain circumstances, our shareholders may have statutory pre-emption rights under the Companies Act in respect of the allotment of new shares in our Company. These statutory pre-emption rights, when applicable, would require us to offer new shares for allotment to our existing shareholders on a pro rata basis before allotting them to other persons. In such circumstances, the procedure for the exercise of such statutory pre-emption rights would be set out in the documentation by which such shares would be offered to our shareholders. These statutory pre-emption rights may be disapplied by a special resolution passed by our shareholders in a general meeting in accordance with the provisions of the Companies Act.

Board of Directors—Number and Classification

The articles provide that the number of directors will not be less than two and, except as otherwise determined by a majority of directors, not more than fifteen. The articles further provide that except as otherwise determined by a majority of the directors, the directors will be divided into three classes, designated as Class A, Class B and Class C, respectively, and each class will consist, as nearly as possible, of a number of directors equal to

one-third of the total number of directors. Directors will be assigned to each class in accordance with a resolution or resolutions adopted by the Board.

These provisions would preclude a third party from removing incumbent directors and simultaneously gaining control of the board by filling the vacancies created by removal with its own nominees. Under the classified board provisions described above, it would take at least two elections of directors for any individual or group to gain control of the board. Accordingly, these provisions could discourage a third party from initiating a proxy contest, making a tender offer or otherwise attempting to gain control of our Company.

Other Provisions Relating to Our Company's Ordinary Shares

General Meetings and Notices

The notice of a general meeting shall be given to the shareholders (other than any who, under the provisions of our articles or the terms of allotment or issue of shares, are not entitled to receive notice), to our board of directors and to our auditors. Under English law, we are required to hold an annual general meeting of shareholders within six months from the day following the end of our fiscal year and, subject to the foregoing, the meeting may be held at a time and place determined by our board of directors, whether within or outside of the U.K.

Disclosure of Ownership Interests in Shares

Section 793 of the Companies Act gives our Company the power to require persons whom it knows have, or whom it has reasonable cause to believe have, or within the previous three years have had, any ownership interest in any Liberty Global shares to disclose specified information regarding those shares. Failure to provide the information requested within the prescribed period (or knowingly or recklessly providing false information) after the date the notice is sent can result in criminal or civil sanctions being imposed against the person in default.

If any shareholder, or any other person appearing to be interested in Liberty Global shares held by such shareholder, fails to respond to a Section 793 notice, or, in purported compliance with such a notice, makes a statement which is materially false or misleading then our board of directors may withdraw voting and certain other rights, place restrictions on the rights to receive dividends and transfer such shares (including any shares allotted or issued after the date of the Section 793 notice in respect of those shares).

Transfer of Shares

Shareholders may transfer all or any of their shares by instrument of transfer in writing in any usual form or in any other form which is permitted by the Companies Act and is approved by our board of directors. The instrument of transfer must be executed by or on behalf of the transferor (and in the case of a transfer of a share which is not fully paid, by or on behalf of the transferee).

Our board of directors may refuse to register a transfer if:

- it is with respect to shares in certificated form that are not fully paid, so long as the refusal does not prevent dealings in Liberty Global shares from taking place on an open and proper basis;
- it is with respect to shares on which Liberty Global has a lien, including with respect to shares that are not fully paid;
- the instrument of transfer is not duly stamped to show payment of stamp duty (if such stamp is required) and presented with the share certificate or other evidence of title reasonably required by the directors;
- the instrument of transfer is in respect of more than one class of shares;
- the instrument of transfer is in favor of more than four persons jointly; or
- in certain circumstances, if the holder has failed to provide the information requested by Liberty Global referred to in “—*Disclosure of Ownership Interests in Shares*” above.

If our board of directors refuses to register a transfer of a share, it shall, within two months after the date on which the instrument of transfer was delivered to our Company, send to the transferee notice of the refusal, together with its reasons for refusal.

Liability of Liberty Global and its Directors and Officers

Our articles provide that English courts have exclusive jurisdiction with respect to any suits brought by shareholders (in their capacity as such) against our Company or our directors.

English law does not permit our Company to exempt any director from any liability arising from negligence, default, breach of duty or breach of trust in relation to our Company. However, despite this prohibition, we are permitted to purchase and maintain limited insurance for any of our directors. Shareholders can ratify by ordinary resolution a director’s conduct amounting to negligence, default, breach of duty or breach of trust in relation to our Company.

Takeover Provisions

An English public limited company is potentially subject to the U.K. City Code on Takeovers and Mergers, which we refer to in this Annual Report as the Takeover Code if, among other factors, (i) its place of central management and control is within the U.K., the Channel Islands or the Isle of Man or (ii) if any of its securities are admitted to trading on a regulated market or a multilateral trading facility in the United Kingdom or on any stock exchange in the Channel Islands or the Isle of Man. The Takeover Panel will generally look to the residency of a company’s directors to determine where it is centrally managed and controlled.

Based upon the residency of our directors and management and listing of our securities, the Takeover Code would not presently apply to us. It is possible that, in the future, circumstances could change that may cause the Takeover Code to apply to us. If we become subject to the Takeover Code, the ability of our directors to engage in defensive measures to seek to frustrate bids will, in addition to being subject to the directors’ statutory and fiduciary duties, be subject to the provisions of the Takeover Code.

Issuance of Preference Shares and Other Shares

The shares allotted and issued pursuant to the board’s general authority described above may comprise (in whole or in part) preference shares or other shares, in one or more classes with such rights, preferences and restrictions as our board of directors shall determine. The issuance of preference shares on various terms could adversely affect the holders of other Liberty Global shares. The potential issuance of preference shares may discourage bids for our shares at a premium over the market price, may adversely affect the market price of our shares and may discourage, delay or prevent a change of control of our Company.

Taxes

The following summarizes certain UK tax consequences generally applicable to the holding and disposition of the Liberty Global Ordinary Shares and is based on current UK tax law and HM Revenue & Customs ("**HMRC**") published practice. It does not purport to be a complete analysis of or listing of all the possible UK tax considerations which may arise. It relates only to persons who (i) are absolute beneficial owners holding Liberty Global Ordinary Shares as a capital investment, (ii) are resident for tax purposes solely in the United States, and (iii) do not carry on (whether solely or in partnership) any trade, profession or vocation in the United Kingdom through a branch or agency to which those shares are attributable, or, in the case of corporate holders of Liberty Global Ordinary Shares, do not carry on a trade in the United Kingdom through a permanent establishment to which those shares are attributable (persons meeting each of the descriptions in (i), (ii) and (iii) being "**US Holders**").

Shareholders should consult their own tax advisors in respect of the tax consequences related to receipt, ownership, purchase or sale or other disposition of their Liberty Global Ordinary Shares.

United Kingdom withholding tax

No UK tax will be required to be withheld from dividends paid in respect of Liberty Global Ordinary Shares. As this is the case under UK domestic tax law, it is not necessary to rely on the UK-USA Double Taxation Convention in order to secure reduction or elimination of withholding for or on account of UK tax in relation to such dividends.

United Kingdom tax on dividends

U.S. Holders will not be chargeable to UK income tax or UK corporation tax on income in relation to dividends received in respect of their Liberty Global Ordinary Shares.

Disposition of Liberty Global Ordinary Shares

U.S. Holders will not be subject to UK tax on chargeable gains arising on the disposal of their Liberty Global Ordinary Shares.

United Kingdom stamp duty and stamp duty reserve tax ("SDRT")

An agreement to transfer an interest in Liberty Global Ordinary Shares through a clearance service or depositary receipt system should not give rise to a liability to SDRT (unless, in the case of a clearance service, it has made a relevant election under Section 97A of the UK Finance Act 1986). We understand that HMRC regards the facilities of The Depository Trust Company ("**DTC**") as a clearance service for these purposes. In addition, no UK stamp duty should, in practice, need be paid in respect of a paperless transfer of an interest in Liberty Global Ordinary Shares through the DTC.

The transfer on a sale of an interest in Liberty Global Ordinary Shares by means of written instrument will generally be liable to UK stamp duty at a rate of 0.5% of the consideration paid (rounded up to the nearest multiple of £5) unless the instrument is not executed in the United Kingdom and remains at all times outside the United Kingdom and the transfer does not relate to any matter or thing done or to be done in the United Kingdom. An exemption from UK stamp duty is available for a written instrument transferring an interest in Liberty Global Ordinary Shares where the amount or value of the consideration is £1,000 or less, and it is certified on the instrument that the transaction effected by the instrument does not form part of a larger transaction or series of transactions for which the aggregate consideration exceeds £1,000. A charge to SDRT will also arise (at the rate of 0.5% of the consideration paid) on an agreement to transfer an interest in Liberty Global Ordinary Shares otherwise than through a clearance service (unless the clearance service has made a relevant election under Section 97A of the UK Finance Act 1986) or depositary receipt system, although the liability will be cancelled and a claim for repayment of any SDRT already paid, generally with interest, may be made provided that an instrument transferring the interest in Liberty Global Ordinary Shares is executed in pursuance of the agreement and that instrument is duly

stamped within six years of the date on which the agreement was made or, if the agreement was conditional, the date on which the agreement became unconditional.

An issue or transfer of Liberty Global Ordinary Shares to a person whose business is or includes the provision of clearance services (or its nominee) or issuing depositary receipts (or its nominee or agent) may give rise to a charge to UK stamp duty or SDRT at the rate of 1.5% of, broadly, the amount or value of the consideration payable or, in certain circumstances, the value of Liberty Global Ordinary Shares (unless, in the case of a clearance service, it has made a relevant election under Section 97A of the UK Finance Act 1986). This liability for UK stamp duty or SDRT will strictly be accountable by the depositary or clearance service operator or its nominee or agent, as the case may be, but will, in practice, generally be reimbursed by participants in the clearance service or depositary receipt system. HMRC has confirmed that in general it will no longer seek to apply the 1.5% SDRT charge to issues of UK shares to clearance services (or their nominee) or depositary receipt issuers (or their nominee or agent) or to transfers of UK shares to such entities that are an integral part of an issue of share capital, on the basis that the charge in such circumstances was not compatible with EU law. The UK government stated in the Autumn Budget 2017 that it did not intend to reintroduce the 1.5% charge on the issue of shares (and transfers integral to capital raising) into overseas clearance services and depositary receipt systems following the UK's exit from the EU. However, the above does not have any impact on a transfer of Liberty Global Ordinary Shares to such entities where such transfer is not an integral part of an issue of share capital and, accordingly, the 1.5% charges discussed in this paragraph will continue to apply to transfers of Liberty Global Ordinary Shares to such entities which are not an integral part of an issue of share capital.

Therefore, a transfer of title in Liberty Global Ordinary Shares or an agreement to transfer such shares from within the DTC system out of the DTC system, and any subsequent transfers or agreements to transfer outside the DTC system, will generally attract a charge to UK stamp duty and/or SDRT at a rate of 0.5% of any consideration. Any such duty must be paid (and the relevant transfer document stamped by HMRC) before the transfer can be registered in the books of Liberty Global. Shareholders should note in particular that a redeposit of Liberty Global Ordinary Shares into the DTC system, including by means of an initial transfer into a depositary receipt system, will generally attract UK stamp duty and/or SDRT at the higher rate of 1.5%.

This discussion is for general information only. In addition, US Holders should consult their own tax advisors regarding the U.S. tax consequences of the purchase, ownership and disposition of Liberty Global Ordinary Shares.

Stock Exchange Listings

The Liberty Global Class A Ordinary Shares, the Liberty Global Class B Ordinary Shares and the Liberty Global Class C Ordinary Shares trade on Nasdaq under the symbols "LBTYA," "LBTYB" and "LBTYK," respectively.

Share Transfer Agent and Registrar

Computershare Trust Company, N.A. is the transfer agent and registrar for all classes of our ordinary shares.

Liberty Global plc Subsidiaries
December 31, 2019

Name	Country
Liberty Global Services GmbH	Austria
Liberty Global Swiss Services GmbH	Austria
De Vijver Media NV	Belgium
Décor Oyenbrug BVBA	Belgium
Desert Fishes NV	Belgium
EBS International NV	Belgium
Loft International BV	Belgium
Native Nation BVBA	Belgium
SBS Sales Belgium NV	Belgium
SBS Belgium NV	Belgium
Stream32 BVBA	Belgium
T.T.T.I. BVBA	Belgium
Telenet BVBA	Belgium
Telenet Finance BVBA	Belgium
Telenet Group NV/SA	Belgium
Telenet Group Holding N.V.	Belgium
Telenet Retail BVBA	Belgium
Telenet Tecteo Bidco NV	Belgium
Telenet Vlaanderen NV	Belgium
The Park Entertainment NV	Belgium
Woestijnvis NV	Belgium
UPC Real Estate s.r.o.	Czech Republic
UPC Broadband France S.A.S.	France
UPC Broadband France SNC	France
Unitymedia Finanz-Service GmbH	Germany
Liberty Global Smart Sourcing GmbH	Germany
Casey Cablevision Limited	Ireland
Channel 6 Broadcasting Limited	Ireland
Cullen Broadcasting Limited	Ireland
Imminus (Ireland) Limited	Ireland
Kish Media Limited	Ireland
LGI DTH Ireland Ltd	Ireland
P.B.N. Holdings Ltd	Ireland
Tullamore Beta Limited	Ireland
TVThree Enterprises Limited	Ireland
TVThree Sales Limited	Ireland
Ulana Business Management Ltd	Ireland
UPC Broadband Ireland Ltd	Ireland
Virgin Media Ireland Ltd	Ireland
Virgin Media Television	Ireland

Name	Country
Coditel S.à.r.l.	Luxembourg
Finance Center Telenet Sàrl	Luxembourg
Liberty Global Luxembourg Sàrl	Luxembourg
Liberty Property Holdco I Sàrl	Luxembourg
Liberty Property Holdco II Sàrl	Luxembourg
Telenet Finance Luxembourg Notes Sàrl	Luxembourg
Telenet International Finance Sàrl	Luxembourg
Telenet Luxembourg Finance Center Sàrl	Luxembourg
Telenet Solutions Luxembourg NV	Luxembourg
Liberty Global Holding Company Limited	Malta
Liberty Global Insurance Company Limited	Malta
Binan Investments B.V.	Netherlands
Labesa Holding B.V.	Netherlands
LGCI Holdco I BV	Netherlands
LGI Ventures B.V.	Netherlands
Liberty Global B.V.	Netherlands
Liberty Global CE Holding B.V.	Netherlands
Liberty Global CEE Group Holding BV	Netherlands
Liberty Global Communication Services BV	Netherlands
Liberty Global Content Investments BV	Netherlands
Liberty Global Europe Financing B.V.	Netherlands
Liberty Global Europe HoldCo 2 B.V.	Netherlands
Liberty Global Europe Holding B.V.	Netherlands
Liberty Global Europe Holding II B.V.	Netherlands
Liberty Global Europe Holding III B.V.	Netherlands
Liberty Global Europe Investments B.V.	Netherlands
Liberty Global Europe Management B.V.	Netherlands
Liberty Global Holding B.V.	Netherlands
Liberty Global Services B.V.	Netherlands
Liberty Global Switzerland HoldCo BV	Netherlands
Liberty Global Ventures Group Holding BV	Netherlands
Liberty Global Ventures Holding BV	Netherlands
UPC Broadband Holding B.V.	Netherlands
UPC CEE Holding BV	Netherlands
UPC DTH Holding BV	Netherlands
UPC France Holding B.V.	Netherlands
UPC Germany Holding B.V.	Netherlands
UPC Holding B.V.	Netherlands
UPC Holding II B.V.	Netherlands
UPC Poland Holding B.V.	Netherlands
UPC Slovakia Group Holding BV	Netherlands
UPC Slovakia Holding I BV	Netherlands
UPC Slovakia Holding II BV	Netherlands
UPC Switzerland Holding BV	Netherlands
UPC Poland Property SP zoo	Poland
UPC Polska Sp. z o.o	Poland

Name	Country
UPC Broadband Slovakia sro	Slovak Republic
Sitel SA	Switzerland
Teledistal SA	Switzerland
Telelavaux SA	Switzerland
UPC Schweiz GmbH	Switzerland
Video 2000 SA	Switzerland
BCMV Limited	UK-England & Wales
Birmingham Cable Corporation Limited	UK-England & Wales
Birmingham Cable Limited	UK-England & Wales
Bitbuzz UK Limited	UK-England & Wales
Blue Yonder Workwise Limited	UK-England & Wales
Cable London Limited	UK-England & Wales
Cable on Demand Limited	UK-England & Wales
CableTel Herts and Beds Limited	UK-England & Wales
CableTel Surrey and Hampshire Limited	UK-England & Wales
Catalyst NewCo 1 Limited	UK-England & Wales
Catalyst NewCo 3 Limited	UK-England & Wales
Diamond Cable Communications Limited	UK-England & Wales
Eurobell (Holdings) Limited	UK-England & Wales
Filegale Limited	UK-England & Wales
Flextech Broadband Limited	UK-England & Wales
Flextech Interactive Limited	UK-England & Wales
Flextech Limited	UK-England & Wales
General Cable Limited	UK-England & Wales
General Cable Programming Limited	UK-England & Wales
Global Handset Finco Ltd	UK-England & Wales
LGCI HoldCo III Ltd	UK-England & Wales
LGCI Holdings Limited	UK-England & Wales
Liberty Networks Limited	UK-England & Wales
Liberty Global Broadband Germany Holding II Limited	UK-England & Wales
Liberty Global Broadband Germany Holding Limited	UK-England & Wales
Liberty Global Broadband Holding Limited	UK-England & Wales
Liberty Global Broadband I Limited	UK-England & Wales
Liberty Global Broadband II Limited	UK-England & Wales
Liberty Global Capital Limited	UK-England & Wales
Liberty Global Content Investments Holding Limited	UK-England & Wales
Liberty Global Content Investments Limited	UK-England & Wales
Liberty Global Europe 2 Limited	UK-England & Wales
Liberty Global Europe 3 Limited	UK-England & Wales
Liberty Global Europe Limited	UK-England & Wales
Liberty Global Finance I (UK) Limited	UK-England & Wales
Liberty Global Finance II (UK) Limited	UK-England & Wales
Liberty Global Incorporated Limited	UK-England & Wales
Liberty Global Management Services Limited	UK-England & Wales
Liberty Global plc	UK-England & Wales
Liberty Global Technology Limited	UK-England & Wales

Name	Country
Liberty Global Ventures Group Limited	UK-England & Wales
Liberty Global Ventures Holding Limited	UK-England & Wales
Liberty Infrastructure Real Estate HoldCo Limited	UK-England & Wales
Liberty Property Co I Limited	UK-England & Wales
Liberty Property Co II Limited	UK-England & Wales
Liberty Property Holdco III Limited	UK-England & Wales
Matchco Limited	UK-England & Wales
ntl (B) Limited	UK-England & Wales
ntl (BMC Plan) Pension Trustees Limited	UK-England & Wales
ntl (Broadland) Limited	UK-England & Wales
ntl (CWC) Corporation Limited	UK-England & Wales
ntl (CWC) Limited	UK-England & Wales
ntl (South East) Limited	UK-England & Wales
ntl (V)	UK-England & Wales
ntl Business Limited	UK-England & Wales
ntl CableComms Cheshire	UK-England & Wales
ntl CableComms Greater Manchester	UK-England & Wales
ntl CableComms Group Limited	UK-England & Wales
ntl CableComms Holdings No 1 Limited	UK-England & Wales
ntl CableComms Holdings No 2 Limited	UK-England & Wales
ntl CableComms Solent	UK-England & Wales
ntl CableComms Surrey	UK-England & Wales
ntl CableComms Wirral	UK-England & Wales
ntl Cambridge Limited	UK-England & Wales
ntl Communications Services Limited	UK-England & Wales
ntl Glasgow Holdings Limited	UK-England & Wales
ntl Kirklees	UK-England & Wales
ntl Kirklees Holdings Limited	UK-England & Wales
ntl Midlands Limited	UK-England & Wales
ntl National Networks Limited	UK-England & Wales
ntl Pension Trustees Limited	UK-England & Wales
NTL Pension Trustees II Limited	UK-England & Wales
ntl Rectangle Limited	UK-England & Wales
ntl South Central Limited	UK-England & Wales
ntl Telecom Services Limited	UK-England & Wales
ntl Trustees Limited	UK-England & Wales
ntl Victoria Limited	UK-England & Wales
ntl Wirral Telephone and Cable TV Company	UK-England & Wales
Smallworld Cable Limited	UK-England & Wales
Telewest Communications (London South) Limited	UK-England & Wales
Telewest Communications (Midlands and North West) Limited	UK-England & Wales
Telewest Communications (North East) Limited	UK-England & Wales
Telewest Communications (North East) Partnership	UK-England & Wales
Telewest Communications (South East) Limited	UK-England & Wales
Telewest Communications (South West) Limited	UK-England & Wales
Telewest Communications (Tyneside) Limited	UK-England & Wales

Name	Country
Telewest Communications Cable Limited	UK-England & Wales
Telewest Communications Networks Limited	UK-England & Wales
Telewest Limited	UK-England & Wales
Telewest Workwise Limited	UK-England & Wales
Theseus No. 1 Limited	UK-England & Wales
Theseus No. 2 Limited	UK-England & Wales
Virgin Media Business Limited	UK-England & Wales
Virgin Media Communications Limited	UK-England & Wales
Virgin Media Employee Medical Trust Limited	UK-England & Wales
Virgin Media Finance plc	UK-England & Wales
Virgin Media Finco Limited	UK-England & Wales
Virgin Media Investment Holdings Limited	UK-England & Wales
Virgin Media Investments Limited	UK-England & Wales
Virgin Media Limited	UK-England & Wales
Virgin Media Mobile Finance Limited	UK-England & Wales
Virgin Media Operations Limited	UK-England & Wales
Virgin Media Payments Limited	UK-England & Wales
Virgin Media PCHC II Limited	UK-England & Wales
Virgin Media PCHC Limited	UK-England & Wales
Virgin Media Secretaries Limited	UK-England & Wales
Virgin Media Secured Finance plc	UK-England & Wales
Virgin Media Senior Investments Limited	UK-England & Wales
Virgin Media SFA Finance Limited	UK-England & Wales
Virgin Media Wholesale Limited	UK-England & Wales
Virgin Mobile Group (UK) Limited	UK-England & Wales
Virgin Mobile Holdings (UK) Limited	UK-England & Wales
Virgin Mobile Telecoms Limited	UK-England & Wales
Virgin WiFi Limited	UK-England & Wales
VM Ireland Group Limited	UK-England & Wales
VM Transfers (No 4) Limited	UK-England & Wales
VMIH Sub Limited	UK-England & Wales
VMWH Limited	UK-England & Wales
Windsor Television Limited	UK-England & Wales
Yorkshire Cable Communications Limited	UK-England & Wales
CableTel Northern Ireland Limited	UK-Northern Ireland
ntl Glasgow	UK-Scotland
Telewest Communications (Dundee & Perth) Limited	UK-Scotland
Telewest Communications (Glenrothes) Limited	UK-Scotland
Telewest Communications (Scotland Holdings) Limited	UK-Scotland
Telewest Communications (Scotland) Limited	UK-Scotland
LGI Technology Holdings Inc.	USA-Colorado
Liberty Global Management, LLC	USA-Colorado
Liberty Global Services, LLC	USA-Colorado
TCI US West Cable Communications Group	USA-Colorado
Tyneside Cable Limited Partnership	USA-Colorado
UIM Aircraft, LLC	USA-Colorado

Name	Country
Virgin Media Finance Holdings Inc.	USA-Colorado
Virgin Media Group LLC	USA-Colorado
Virgin Media Inc.	USA-Colorado
Associated SMR, Inc.	USA-Delaware
LGCI HoldCo LP	USA-Delaware
LGI International LLC	USA-Delaware
LGI Slovakia Holdings Inc.	USA-Delaware
LGI Ventures Management, Inc.	USA-Delaware
Liberty Global, Inc.	USA-Delaware
Liberty Programming Japan, LLC	USA-Delaware
Liberty Spectrum Inc.	USA-Delaware
NTL (Triangle) LLC	USA-Delaware
NTL CableComms Group LLC	USA-Delaware
Telenet Financing USD LLC	USA-Delaware
UnitedGlobalCom LLC	USA-Delaware
UPC Financing Partnership	USA-Delaware
Virgin Media Bristol LLC	USA-Delaware

Consent of Independent Registered Public Accounting Firm

The Board of Directors
Liberty Global plc:

We consent to the incorporation by reference in the registration statement (No. 333-189220, 333-189222, 333-189223, 333-189224, 333-194578, 333-194581, 333-205542, and 333-205543) on Form S-8 of Liberty Global plc of our reports dated February 13, 2020, with respect to the consolidated balance sheets of Liberty Global plc as of December 31, 2019 and 2018, the related consolidated statements of operations, comprehensive earnings (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes and financial statement schedules I and II, and the effectiveness of internal control over financial reporting as of December 31, 2019, which reports appear in the December 31, 2019 annual report on Form 10-K of Liberty Global plc.

Our report on the consolidated financial statements includes an explanatory paragraph referring to a change in the method of accounting for leases and revenue from contracts with customers.

Our report dated February 13, 2020, on the effectiveness of internal control over financial reporting as of December 31, 2019, contains an explanatory paragraph that states the aggregate amount of total assets and revenue of De Vijver Media NV that are excluded from management's assessment of the effectiveness of internal control over financial reporting as of and for the year ended December 31, 2019 are \$254.5 million and \$81.1 million, respectively. Our audit of internal control over financial reporting also excluded an evaluation of the internal control over financial reporting of De Vijver Media NV.

/s/ KPMG LLP

Denver, Colorado
February 13, 2020

CERTIFICATION

I, Michael T. Fries, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 13, 2020

/s/ Michael T. Fries

Michael T. Fries
President and Chief Executive Officer

CERTIFICATION

I, Charles H.R. Bracken, certify that:

1. I have reviewed this annual report on Form 10-K of Liberty Global plc;
2. Based on my knowledge, this annual report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this annual report;
3. Based on my knowledge, the financial statements, and other financial information included in this annual report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this annual report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and we have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this annual report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, 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;
 - c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this annual report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this annual report based on such evaluation; and
 - d) Disclosed in this annual report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 13, 2020

/s/ Charles H.R. Bracken

Charles H.R. Bracken
Executive Vice President and Chief Financial Officer

Certification
Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
(Subsections (a) and (b) of Section 1350, Chapter 63 of Title 18, United States Code)

Pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code), each of the undersigned officers of Liberty Global plc (the "Company"), does hereby certify, to such officer's knowledge, that:

The Annual Report on Form 10-K for the year ended December 31, 2019 (the "Form 10-K") of the Company fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934 and information contained in the Form 10-K fairly presents, in all material respects, the financial condition and results of operations of the Company as of December 31, 2019 and December 31, 2018, and for the years ended December 31, 2019, 2018 and 2017.

Dated: February 13, 2020

/s/ Michael T. Fries

Michael T. Fries

President and Chief Executive Officer

Dated: February 13, 2020

/s/ Charles H.R. Bracken

Charles H.R. Bracken

Executive Vice President and Chief Financial Officer

The foregoing certification is being furnished solely pursuant to section 906 of the Sarbanes-Oxley Act of 2002 (subsections (a) and (b) of section 1350, chapter 63 of title 18, United States Code) and is not being filed as part of the Form 10-K or as a separate disclosure document.