GOLDMAN SACHS GROUP INC
Form 424B2
September 27, 2018

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Registration Statement No. 333-219206

GS Finance Corp.

$233,000

Callable Contingent Coupon Index-Linked Notes due 2028

guaranteed by

The Goldman Sachs Group, Inc.

The notes do not pay a fixed coupon and may pay no coupon on a payment date. The amount that you will be paid on your notes is based on the performances of the S&P 500® Index, the EURO STOXX 50® Index and the Russell 2000® Index. The notes will mature on September 28, 2028, unless we redeem them.

We may redeem your notes at 100% of their face amount plus any coupon then due on any payment date (the 28th day of each March, June, September and December, commencing in December 2018 and ending on the stated maturity date) on or after the payment date in March 2019 up to the payment date in June 2028.

If we do not redeem your notes, if the closing level of each index is greater than or equal to 75% of its initial level (the initial levels are 2,905.97 with respect to the S&P 500® Index, 3,433.15 with respect to the EURO STOXX 50® Index and 1,691.608 with respect to the Russell 2000® Index) on a determination date (the tenth scheduled trading day for all indices prior to each payment date), you will receive on the applicable payment date a coupon of $23.875 for each $1,000 face amount of your notes. If the closing level of any index on a determination date is less than 75% of its initial level, you will not receive a coupon on the applicable payment date.

If we do not redeem your notes, the amount that you will be paid on your notes at maturity, in addition to the final coupon, if any, is based on the performance of the lesser performing index (the index with the lowest index return). The index return for each index is the percentage increase or decrease in the final level of such index on the final determination date from its initial level.

At maturity, for each $1,000 face amount of your notes you will receive an amount in cash equal to:

- if the index return of each index is greater than or equal to -25% (the final level of each index is greater than or equal to 75% of its initial level), $1,000 plus the final coupon of $23.875;
- if the index return of each index is greater than or equal to -40% (the final level of each index is greater than or equal to 60% of its initial level) but the index return of any index is less than -25% (the final level of any index is less than 75% of its initial level), $1,000. You will not receive a coupon; or
- if the index return of any index is less than -40% (the final level of any index is less than 60% of its initial level), the sum of (i) $1,000 plus (ii) the product of (a) the lesser performing index return times (b) $1,000. You will receive less than 60% of the face amount of your notes and you will not receive a final coupon.

You should read the disclosure herein to better understand the terms and risks of your investment, including the credit risk of GS Finance Corp. and The Goldman Sachs Group, Inc. See page S-11.

The estimated value of your notes at the time the terms of your notes are set on the trade date is equal to approximately $948 per $1,000 face amount. For a discussion of the estimated value and the price at which Goldman Sachs & Co. LLC would initially buy or sell your notes, if it makes a market in the notes, see the following page.

Original issue date:	September 28, 2018	Original issue price:	100% of the face amount
Underwriting discount:	4.45% of the face amount	Net proceeds to the issuer:	95.55% of the face amount

Neither the Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense. The notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Goldman Sachs & Co. LLC

Prospectus Supplement No. 4,196 dated September 26, 2018.

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The issue price, underwriting discount and net proceeds listed above relate to the notes we sell initially. We may decide to sell additional notes after the date of this prospectus supplement, at issue prices and with underwriting discounts and net proceeds that differ from the amounts set forth above. The return (whether positive or negative) on your investment in notes will depend in part on the issue price you pay for such notes.

GS Finance Corp. may use this prospectus in the initial sale of the notes. In addition, Goldman Sachs & Co. LLC, or any other affiliate of GS Finance Corp. may use this prospectus in a market-making transaction in a note after its initial sale. Unless GS Finance Corp. or its agent informs the purchaser otherwise in the confirmation of sale, this prospectus is being used in a market-making transaction.

Estimated Value of Your Notes

The estimated value of your notes at the time the terms of your notes are set on the trade date (as determined by reference to pricing models used by Goldman Sachs & Co. LLC (GS&Co.) and taking into account our credit spreads) is equal to approximately $948 per $1,000 face amount, which is less than the original issue price. The value of your notes at any time will reflect many factors and cannot be predicted; however, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would initially buy or sell notes (if it makes a market, which it is not obligated to do) and the value that GS&Co. will initially use for account statements and otherwise is equal to approximately the estimated value of your notes at the time of pricing, plus an additional amount (initially equal to $12 per $1,000 face amount).

Prior to March 28, 2019, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would buy or sell your notes (if it makes a market, which it is not obligated to do) will equal approximately the sum of (a) the then-current estimated value of your notes (as determined by reference to GS&Co.'s pricing models) plus (b) any remaining additional amount (the additional amount will decline to zero on a straight-line basis from the time of pricing through March 27, 2019). On and after March 28, 2019, the price (not including GS&Co.'s customary bid and ask spreads) at which GS&Co. would buy or sell your notes (if it makes a market) will equal approximately the then-current estimated value of your notes determined by reference to such pricing models.

About Your Prospectus

The notes are part of the Medium-Term Notes, Series E program of GS Finance Corp., and are fully and unconditionally guaranteed by The Goldman Sachs Group, Inc. This prospectus includes this prospectus supplement and the accompanying documents listed below. This prospectus supplement constitutes a supplement to the documents listed below and should be read in conjunction with such documents:

- Prospectus supplement dated July 10, 2017
- Prospectus dated July 10, 2017

The information in this prospectus supplement supersedes any conflicting information in the documents listed above. In addition, some of the terms or features described in the listed documents may not apply to your notes.

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SUMMARY INFORMATION

We refer to the notes we are offering by this prospectus supplement as the "offered notes" or the "notes". Each of the offered notes has the terms described below and under "Specific Terms of Your Notes" on page S-21. Please note that in this prospectus supplement, references to "GS Finance Corp.", "we", "our" and "us" mean only GS Finance Corp. and do not include its subsidiaries or affiliates, references to "The Goldman Sachs Group, Inc.", our parent company, mean only The Goldman Sachs Group, Inc. and do not include its subsidiaries or affiliates and references to "Goldman Sachs" mean The Goldman Sachs Group, Inc. together with its consolidated subsidiaries and affiliates, including us. Also, references to the "accompanying prospectus" mean the accompanying prospectus, dated July 10, 2017, and references to the "accompanying prospectus supplement" mean the accompanying prospectus supplement, dated July 10, 2017, for Medium-Term Notes, Series E, in each case of GS Finance Corp. and The Goldman Sachs Group, Inc. References to the "indenture" in this prospectus supplement mean the senior debt indenture, dated as of October 10, 2008, as supplemented by the First Supplemental Indenture, dated as of February 20, 2015, each among us, as issuer, The Goldman Sachs Group, Inc., as guarantor, and The Bank of New York Mellon, as trustee. This indenture, as so supplemented and as further supplemented thereafter, is referred to as the "GSFC 2008 indenture" in the accompanying prospectus supplement.

Key Terms

Issuer: GS Finance Corp.

Guarantor: The Goldman Sachs Group, Inc.

Indices: the S&P 500® Index (Bloomberg symbol, "SPX Index"), as published by S&P Dow Jones Indices LLC, the EURO STOXX 50® Index (Bloomberg symbol, "SX5E Index"), as sponsored and maintained by STOXX Limited, and the Russell 2000® Index (Bloomberg symbol, "RTY Index"), as published by FTSE Russell; see "The Indices" on page S-30

Specified currency: U.S. dollars ("$")

Face amount: each note will have a face amount equal to $1,000; $233,000 in the aggregate for all the offered notes; the aggregate face amount of the offered notes may be increased if the issuer, at its sole option, decides to sell an additional amount of the offered notes on a date subsequent to the date of this prospectus supplement

Denominations: $1,000 and integral multiples of $1,000 in excess thereof

Purchase at amount other than face amount: the amount we will pay you for your notes on the stated maturity date or upon any early redemption of your notes will not be adjusted based on the issue price you pay for your notes, so if you acquire notes at a premium (or discount) to face amount and hold them to the stated maturity date or date of early redemption, it could affect your investment in a number of ways. The return on your investment in such notes will be lower (or higher) than it would have been had you purchased the notes at face amount. See "Additional Risk Factors Specific to Your Notes — If You Purchase Your Notes at a Premium to Face Amount, the Return on Your Investment Will Be Lower Than the Return on Notes Purchased at Face Amount and the Impact of Certain Key Terms of the Notes Will Be Negatively Affected" on page S-14 of this prospectus supplement

Supplemental discussion of U.S. federal income tax consequences: you will be obligated pursuant to the terms of the notes — in the absence of a change in law, an administrative determination or a judicial ruling to the contrary — to characterize each note for all tax purposes as an income-bearing pre-paid derivative contract in respect of the indices, as described under "Supplemental Discussion of Federal Income Tax Consequences" herein. Pursuant to this approach, it is the opinion of Sidley Austin llp that it is likely that any coupon payment will be taxed as ordinary income in accordance with your regular method of accounting for U.S. federal income tax purposes. If you are a United States alien holder of the notes, we intend to withhold on coupon payments made to you at a 30% rate or at a lower rate specified by an applicable income tax treaty. In addition, upon the sale, exchange, redemption or maturity of your notes, it would be reasonable for you to recognize capital gain or loss equal to the difference, if any, between the

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amount of cash you receive at such time (excluding amounts attributable to any coupon payment) and your tax basis in your notes.
Cash settlement amount: subject to our redemption right, for each $1,000 face amount of your notes, we will pay you on the stated maturity date an amount in cash equal to:

- if the index return of each index is greater than or equal to -25%, $1,000 plus the final coupon;
- if the index return of each index is greater than or equal to -40% but the index return of any index is less than -25%, $1,000. You will not receive a coupon; or
- if the index return of any index is less than -40%, the sum of (i) $1,000 plus (ii) the product of (a) the lesser performing index return times (b) $1,000.

Early redemption right: we have the right to redeem your notes, in whole but not in part, at a price equal to 100% of the face amount plus any coupon then due, on each coupon payment date commencing in March 2019 and ending in June 2028, subject to at least ten business days' prior notice
Lesser performing index return: the index return of the lesser performing index
Lesser performing index: the index with the lowest index return
Coupon: subject to our redemption right, on each coupon payment date, for each $1,000 face amount of your notes, we will pay you an amount in cash equal to:

- if the closing level of each index on the related coupon determination date is greater than or equal to 75% of its initial index level, $23.875; or
- if the closing level of any index on the related coupon determination date is less than 75% of its initial index level, $0

Initial index level: 2,905.97 with respect to the S&P 500® Index, 3,433.15 with respect to the EURO STOXX 50® Index and 1,691.608 with respect to the Russell 2000® Index
Final index level: with respect to each index, the closing level of such index on the determination date, except in the limited circumstances described under "Specific Terms of Your Notes — Consequences of a Market Disruption Event or a Non-Trading Day" on page S-24
Closing level: with respect to each index on any trading day, the closing level of such index, as further described under "Specific Terms of Your Notes — Special Calculation Provisions — Closing Level" on page S-26
Index return: with respect to each index on the determination date, the quotient of (i) the final index level minus the initial index level divided by (ii) the initial index level, expressed as a positive or negative percentage
Defeasance: not applicable
No listing: the offered notes will not be listed or displayed on any securities exchange or interdealer market quotation system
Business day: as described under "Specific Terms of Your Notes — Special Calculation Provisions — Business Day" on page S-26
Trading day: as described under "Specific Terms of Your Notes — Special Calculation Provisions — Trading Day" on page S-26
Trade date: September 26, 2018
Original issue date (settlement date): September 28, 2018
Stated maturity date: September 28, 2028, subject to adjustment as described under "Specific Terms of Your Notes — Stated Maturity Date" on page S-23
Determination date: the last coupon determination date, September 14, 2028, subject to adjustment as described under "Specific Terms of Your Notes — Determination Date" on page S-23
Coupon determination dates: the tenth scheduled trading day for all indices prior to each coupon payment date, subject to adjustment as described under "Specific Terms of Your Notes —Coupon Determination Dates" on page S-23
Coupon payment dates: the 28th day of each March, June, September and December, commencing in December 2018 and ending on the stated maturity date, subject to adjustment as described under "Specific Terms of Your Notes — Coupon and Coupon Payment Dates" on page S-23

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Regular record dates: the scheduled business day immediately preceding the day on which payment is to be made (as such payment date may be adjusted)

Calculation agent: GS&Co.

CUSIP no.: 40055QX31

ISIN no.: US40055QX319

FDIC: the notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or any other governmental agency, nor are they obligations of, or guaranteed by, a bank

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HYPOTHETICAL EXAMPLES

The following examples are provided for purposes of illustration only. They should not be taken as an indication or prediction of future investment results and are intended merely to illustrate (i) the impact that various hypothetical closing levels of the indices on a coupon determination date could have on the coupon payable, if any, on the related coupon payment date and (ii) the impact that the various hypothetical closing levels of the lesser performing index on the determination date could have on the cash settlement amount at maturity assuming all other variables remain constant.

The examples below are based on a range of index levels that are entirely hypothetical; no one can predict what the index level of any index will be on any day throughout the life of your notes, what the closing level of any index will be on any coupon determination date and what the final index level of the lesser performing index will be on the determination date. The indices have been highly volatile in the past — meaning that the index levels have changed substantially in relatively short periods — and their performance cannot be predicted for any future period.

The information in the following examples reflects the hypothetical rates of return on the offered notes assuming that they are purchased on the original issue date at the face amount and held to the stated maturity date or date of early redemption. If you sell your notes in a secondary market prior to the stated maturity date or date of early redemption, as the case may be, your return will depend upon the market value of your notes at the time of sale, which may be affected by a number of factors that are not reflected in the examples below such as interest rates, the volatility of the indices, the creditworthiness of GS Finance Corp., as issuer, and the creditworthiness of The Goldman Sachs Group, Inc., as guarantor. In addition, the estimated value of your notes at the time the terms of your notes are set on the trade date (as determined by reference to pricing models used by GS&Co.) is less than the original issue price of your notes. For more information on the estimated value of your notes, see "Additional Risk Factors Specific to Your Notes — The Estimated Value of Your Notes At the Time the Terms of Your Notes Are Set On the Trade Date (as Determined By Reference to Pricing Models Used By GS&Co.) Is Less Than the Original Issue Price Of Your Notes" on page S-11 of this prospectus supplement. The information in the examples also reflect the key terms and assumptions in the box below.

Key Terms and Assumptions	
Face amount	$1,000
Initial index level of the S&P 500® Index	2,905.97
Initial index level of the EURO STOXX 50® Index	3,433.15
Initial index level of the Russell 2000® Index	1,691.608
Coupon	$23.875
Neither a market disruption event nor a non-trading day occurs on any originally scheduled coupon determination date or the originally scheduled determination date	
No change in or affecting any of the index stocks or the method by which the applicable index sponsor calculates any index	
Notes purchased on original issue date at the face amount and held to the stated maturity date or date of early redemption	

For these reasons, the actual performance of the indices over the life of your notes, the actual index levels on any coupon determination date, as well as the coupon payable, if any, on each coupon payment date, may bear little relation to the hypothetical examples shown below or to the historical index levels shown elsewhere in this prospectus supplement. For information about the index levels during recent periods, see "The Indices — Historical Closing Levels of the Indices" on page S-49. Before investing in the notes, you should consult publicly available information to determine the index levels between the date of this prospectus supplement and the date of your purchase of the notes. Also, the hypothetical examples shown below do not take into account the effects of applicable taxes. Because of the U.S. tax treatment applicable to your notes, tax liabilities could affect the after-tax rate of return on your notes to a comparatively greater extent than the after-tax return on the index stocks.

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Hypothetical Coupon Payments

The examples below show hypothetical performances of each index as well as the hypothetical coupons, if any, that we would pay on each coupon payment date with respect to each $1,000 face amount of the notes if the closing level of each index on the applicable coupon determination date were the hypothetical closing levels shown and 75% of the initial index level of the S&P 500® Index is 2,179.4775, 75% of the initial index level of the EURO STOXX 50® Index is 2,574.8625 and 75% of the initial index level of the Russell 2000® Index is 1,268.706.

Scenario 1

Hypothetical Coupon Determination Date	Hypothetical Closing Level of the S&P 500® Index	Hypothetical Closing Level of the EURO STOXX 50® Index	Hypothetical Closing Level of the Russell 2000® Index	Hypothetical Coupon
First	900	3,200	1,800	$0
Second	900	3,100	800	$0
Third	3,000	2,000	500	$0
Fourth	2,300	3,200	1,300	$23.875
Fifth	900	3,700	1,000	$0
Sixth	2,000	2,000	500	$0
Seventh	2,200	3,000	1,600	$23.875
Eighth	2,100	2,800	500	$0
Ninth	2,150	1,700	550	$0
Tenth	2,000	3,200	500	$0
Eleventh	2,000	3,700	500	$0
Twelfth — Fortieth	1,900	2,000	500	$0
			Total Hypothetical Coupons	$47.75

In Scenario 1, the hypothetical closing level of each index increases and decreases by varying amounts on each hypothetical coupon determination date. Because the hypothetical closing level of each index on the fourth and seventh hypothetical coupon determination dates is greater than or equal to 75% of its initial index level, the total of the hypothetical coupons in Scenario 1 is $47.75. Because the hypothetical closing level of at least one index on all other hypothetical coupon determination dates is less than 75% of its initial index level, no further coupons will be paid, including at maturity.

Scenario 2

Hypothetical Coupon Determination Date	Hypothetical Closing Level of the S&P 500® Index	Hypothetical Closing Level of the EURO STOXX 50® Index	Hypothetical Closing Level of the Russell 2000® Index	Hypothetical Coupon
First	900	3,200	1,800	$0
Second	900	3,100	800	$0
Third	3,000	2,000	500	$0
Fourth	2,100	1,800	1,050	$0
Fifth	900	3,700	1,000	$0
Sixth	2,000	2,000	500	$0
Seventh	2,200	2,000	1,100	$0
Eighth	2,100	1,800	500	$0
Ninth	2,150	1,700	550	$0
Tenth	2,000	2,200	500	$0
Eleventh	2,000	1,700	500	$0
Twelfth — Fortieth	1,900	2,000	500	$0
			Total Hypothetical Coupons	$0

In Scenario 2, the hypothetical closing level of each index increases and decreases by varying amounts on each hypothetical coupon determination date. Because in each case the hypothetical closing level of at least one of the indices on the related coupon determination date is less than 75% of its initial index level, you will not receive a coupon payment on the applicable hypothetical coupon payment date. Since this occurs on every hypothetical coupon determination date, the overall return you earn on your notes will be zero or less. Therefore, the total of the hypothetical coupons in Scenario 2 is $0.

Scenario 3

Hypothetical Coupon Determination Date	Hypothetical Closing Level of the S&P 500® Index	Hypothetical Closing Level of the EURO STOXX 50® Index	Hypothetical Closing Level of the Russell 2000® Index	Hypothetical Coupon
First	900	2,000	900	$0

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Second	3,000	3,700	1,800	$23.875
			Total Hypothetical Coupons	$23.875

In Scenario 3, the hypothetical closing level of each index is less than 75% of its initial index level on the first hypothetical coupon determination date, but increases to a level that is greater than its initial index level on the second hypothetical coupon determination date. Further, we also exercise our early redemption right with respect to a redemption on the second coupon payment date (which is also the first hypothetical date with respect to which we could exercise such right). Therefore, on the second coupon payment date (the redemption date), in addition to the hypothetical coupon of $23.875, you will receive an amount in cash equal to $1,000 for each $1,000 face amount of your notes.

Hypothetical Payment at Maturity

If the notes are not redeemed, the cash settlement amount we would deliver for each $1,000 face amount of your notes on the stated maturity date will depend on the performance of the lesser performing index on the determination date, as shown in the table below. The table below assumes that the notes have not been redeemed, does not include the final coupon, if any, and reflects hypothetical cash settlement amounts that you could receive on the stated maturity date. If the final index level of the lesser performing index (as a percentage of the initial index level) is less than 75%, you will not be paid a final coupon at maturity.

The levels in the left column of the table below represent hypothetical final index levels of the lesser performing index and are expressed as percentages of the initial index level of the lesser performing index. The amounts in the right column represent the hypothetical cash settlement amounts, based on the corresponding hypothetical final index level of the lesser performing index (expressed as a percentage of the initial index level of the lesser performing index), and are expressed as percentages of the face amount of a note (rounded to the nearest one-thousandth of a percent). Thus, a hypothetical cash settlement amount of 100.000% means that the value of the cash payment that we would deliver for each $1,000 of the outstanding face amount of the offered notes on the stated maturity date would equal 100.000% of the face amount of a note, based on the corresponding hypothetical final index level of the lesser performing index (expressed as a percentage of the initial index level of the lesser performing index) and the assumptions noted above.

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The Notes Have Not Been Redeemed

Hypothetical Final Index Level of the Lesser Performing Index (as Percentage of Initial Index Level)	Hypothetical Cash Settlement Amount at Maturity if the Notes Have Not Been Redeemed (as Percentage of Face Amount)
175.000%	100.000%*
150.000%	100.000%*
125.000%	100.000%*
100.000%	100.000%*
80.000%	100.000%*
75.000%	100.000%*
70.000%	100.000%
60.000%	100.000%
59.999%	59.999%
50.000%	50.000%
25.000%	25.000%
0.000%	0.000%

*Does not include the final coupon

If, for example, the notes have not been redeemed and the final index level of the lesser performing index were determined to be 25.000% of its initial index level, the cash settlement amount that we would deliver on your notes at maturity would be 25.000% of the face amount of your notes, as shown in the table above. As a result, if you purchased your notes on the original issue date at the face amount and held them to the stated maturity date, you would lose 75.000% of your investment (if you purchased your notes at a premium to face amount you would lose a correspondingly higher percentage of your investment). In addition, if the final index level of the lesser performing index were determined to be 175.000% of its initial index level, the cash settlement amount that we would deliver on your notes at maturity would be limited to 100.000% of each $1,000 face amount of your notes, as shown in the table above. As a result, if you held your notes to the stated maturity date, you would not benefit from any increase in the final index level over the initial index level.

The cash settlement amounts shown above are entirely hypothetical; they are based on market prices for the index stocks that may not be achieved on the determination date and on assumptions that may prove to be erroneous. The actual market value of your notes on the stated maturity date or at any other time, including any time you may wish to sell your notes, may bear little relation to the hypothetical cash settlement amounts shown above, and these amounts should not be viewed as an indication of the financial return on an investment in the offered notes. The hypothetical cash settlement amounts on notes held to the stated maturity date in the examples above assume you purchased your notes at their face amount and have not been adjusted to reflect the actual issue price you pay for your notes. The return on your investment (whether positive or negative) in your notes will be affected by the amount you pay for your notes. If you purchase your notes for a price other than the face amount, the return on your investment will differ from, and may be significantly lower than, the hypothetical returns suggested by the above examples. Please read "Additional Risk Factors Specific to Your Notes — The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors" on page S-13.

Payments on the notes are economically equivalent to the amounts that would be paid on a combination of other instruments. For example, payments on the notes are economically equivalent to a combination of an interest-bearing bond bought by the holder and one or more options entered into between the holder and us (with one or more implicit option premiums paid over time). The discussion in this paragraph does not modify or affect the terms of the notes or the U.S. federal income tax treatment of the notes, as described elsewhere in this prospectus supplement.

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We cannot predict the actual closing levels of the indices on any day, the final index levels of the indices or what the market value of your notes will be on any particular trading day, nor can we predict the relationship between the closing levels of the indices and the market value of your notes at any time prior to the stated maturity date. The actual coupon payment, if any, that a holder of the notes will receive on each coupon payment date, the actual amount that you will receive at maturity, if any, and the rate of return on the offered notes will depend on whether or not the notes are redeemed and the actual closing levels of the indices and the actual final index levels determined by the calculation agent as described above. Moreover, the assumptions on which the hypothetical examples are based may turn out to be inaccurate. Consequently, the coupon to be paid in respect of your notes, if any, and the cash amount to be paid in respect of your notes on the stated maturity date, if any, may be very different from the information reflected in the examples above.

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ADDITIONAL RISK FACTORS SPECIFIC TO YOUR NOTES

An investment in your notes is subject to the risks described below, as well as the risks and considerations described in the accompanying prospectus and in the accompanying prospectus supplement. You should carefully review these risks and considerations as well as the terms of the notes described herein and in the accompanying prospectus and the accompanying prospectus supplement. Your notes are a riskier investment than ordinary debt securities. Also, your notes are not equivalent to investing directly in the index stocks, i.e., with respect to an index to which your notes are linked, the stocks comprising such index. You should carefully consider whether the offered notes are suited to your particular circumstances.

The Estimated Value of Your Notes At the Time the Terms of Your Notes Are Set On the Trade Date (as Determined By Reference to Pricing Models Used By GS&Co.) Is Less Than the Original Issue Price Of Your Notes

The original issue price for your notes exceeds the estimated value of your notes as of the time the terms of your notes are set on the trade date, as determined by reference to GS&Co.'s pricing models and taking into account our credit spreads. Such estimated value on the trade date is set forth above under "Estimated Value of Your Notes"; after the trade date, the estimated value as determined by reference to these models will be affected by changes in market conditions, the creditworthiness of GS Finance Corp., as issuer, the creditworthiness of The Goldman Sachs Group, Inc., as guarantor, and other relevant factors. The price at which GS&Co. would initially buy or sell your notes (if GS&Co. makes a market, which it is not obligated to do), and the value that GS&Co. will initially use for account statements and otherwise, also exceeds the estimated value of your notes as determined by reference to these models. As agreed by GS&Co. and the distribution participants, this excess (i.e., the additional amount described under "Estimated Value of Your Notes") will decline to zero on a straight line basis over the period from the date hereof through the applicable date set forth above under "Estimated Value of Your Notes". Thereafter, if GS&Co. buys or sells your notes it will do so at prices that reflect the estimated value determined by reference to such pricing models at that time. The price at which GS&Co. will buy or sell your notes at any time also will reflect its then current bid and ask spread for similar sized trades of structured notes.

In estimating the value of your notes as of the time the terms of your notes are set on the trade date, as disclosed above under "Estimated Value of Your Notes", GS&Co.'s pricing models consider certain variables, including principally our credit spreads, interest rates (forecasted, current and historical rates), volatility, price-sensitivity analysis and the time to maturity of the notes. These pricing models are proprietary and rely in part on certain assumptions about future events, which may prove to be incorrect. As a result, the actual value you would receive if you sold your notes in the secondary market, if any, to others may differ, perhaps materially, from the estimated value of your notes determined by reference to our models due to, among other things, any differences in pricing models or assumptions used by others. See "— The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors" below.

The difference between the estimated value of your notes as of the time the terms of your notes are set on the trade date and the original issue price is a result of certain factors, including principally the underwriting discount and commissions, the expenses incurred in creating, documenting and marketing the notes, and an estimate of the difference between the amounts we pay to GS&Co. and the amounts GS&Co. pays to us in connection with your notes. We pay to GS&Co. amounts based on what we would pay to holders of a non-structured note with a similar maturity. In return for such payment, GS&Co. pays to us the amounts we owe under your notes.

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In addition to the factors discussed above, the value and quoted price of your notes at any time will reflect many factors and cannot be predicted. If GS&Co. makes a market in the notes, the price quoted by GS&Co. would reflect any changes in market conditions and other relevant factors, including any deterioration in our creditworthiness or perceived creditworthiness or the creditworthiness or perceived creditworthiness of The Goldman Sachs Group, Inc. These changes may adversely affect the value of your notes, including the price you may receive for your notes in any market making transaction. To the extent that GS&Co. makes a market in the notes, the quoted price will reflect the estimated value determined by reference to GS&Co.'s pricing models at that time, plus or minus its then current bid and ask spread for similar sized trades of structured notes (and subject to the declining excess amount described above).

Furthermore, if you sell your notes, you will likely be charged a commission for secondary market transactions, or the price will likely reflect a dealer discount. This commission or discount will further reduce the proceeds you would receive for your notes in a secondary market sale.

There is no assurance that GS&Co. or any other party will be willing to purchase your notes at any price and, in this regard, GS&Co. is not obligated to make a market in the notes. See "— Your Notes May Not Have an Active Trading Market" below.

The Notes Are Subject to the Credit Risk of the Issuer and the Guarantor

Although the coupons (if any) and return on the notes will be based on the performance of each index, the payment of any amount due on the notes is subject to the credit risk of GS Finance Corp., as issuer of the notes, and the credit risk of The Goldman Sachs Group, Inc., as guarantor of the notes. The notes are our unsecured obligations. Investors are dependent on our ability to pay all amounts due on the notes, and therefore investors are subject to our credit risk and to changes in the market's view of our creditworthiness. Similarly, investors are dependent on the ability of The Goldman Sachs Group, Inc., as guarantor of the notes, to pay all amounts due on the notes, and therefore are also subject to its credit risk and to changes in the market's view of its creditworthiness. See "Description of the Notes We May Offer — Information About Our Medium-Term Notes, Series E Program — How the Notes Rank Against Other Debt" on page S-4 of the accompanying prospectus supplement and "Description of Debt Securities We May Offer – Guarantee by The Goldman Sachs Group, Inc." on page 42 of the accompanying prospectus.

You May Lose Your Entire Investment in the Notes

You can lose your entire investment in the notes. Subject to our redemption right, the cash settlement amount on your notes, if any, on the stated maturity date will be based on the performance of the lesser performing of the S&P 500® Index, the EURO STOXX 50® Index and the Russell 2000® Index as measured from their initial index levels to their closing levels on the determination date. If the final index level of the lesser performing index for your notes is less than 60% of its initial index level, you will have a loss for each $1,000 of the face amount of your notes equal to the product of the lesser performing index return times $1,000. Thus, you may lose your entire investment in the notes, which would include any premium to face amount you paid when you purchased the notes.

Also, the market price of your notes prior to the stated maturity date may be significantly lower than the purchase price you pay for your notes. Consequently, if you sell your notes before the stated maturity date, you may receive far less than the amount of your investment in the notes.

The Return on Your Notes May Change Significantly Despite Only a Small Change in the Level of the Lesser Performing Index

If your notes are not redeemed and the final index level of the lesser performing index is less than 60% of its initial index level, you will receive less than the face amount of your notes and you could lose all or a substantial portion of your investment in the notes. This means that while a drop of up to 40% between the initial index level and the final index level of the lesser performing index will not result in a loss of principal on the notes, a decrease in the final index level of the lesser performing index to less than 60% of its initial index level will result in a loss of a significant portion of the face amount of the notes despite only a small change in the level of the lesser performing index.

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You May Not Receive a Coupon on Any Coupon Payment Date

If the closing level of any index on the related coupon determination date is less than 75% of its initial index level, you will not receive a coupon payment on the applicable coupon payment date. If this occurs on every coupon determination date, the overall return you earn on your notes will be zero or less and such return will be less than you would have earned by investing in a note that bears interest at the prevailing market rate.

On any coupon payment date, although you will receive a coupon if the closing level of each index on the related coupon determination date is greater than or equal to 75% of its initial index level, the coupon paid on the corresponding coupon payment date will be equal to $23.875. You should be aware that, with respect to any prior coupon determination dates that did not result in the payment of a coupon, you will not be compensated for any opportunity cost implied by inflation and other factors relating to the time value of money. Further, there is no guarantee that you will receive any coupon payment with respect to the notes at any time and you may lose your entire investment in the notes.

We Are Able to Redeem Your Notes at Our Option

On each coupon payment date commencing in March 2019 and ending in June 2028, we will be permitted to redeem your notes at our option. Even if we do not exercise our option to redeem your notes, our ability to do so may adversely affect the value of your notes. It is our sole option whether to redeem your notes prior to maturity and we may or may not exercise this option for any reason. Because of this redemption option, the term of your notes could be anywhere between six months and ten years.

The Coupon Does Not Reflect the Actual Performance of the Indices from the Trade Date to Any Coupon Determination Date or from Coupon Determination Date to Coupon Determination Date

The coupon for each quarterly coupon payment date is different from, and may be less than, a coupon determined based on the percentage difference of the closing levels of the indices between the trade date and any coupon determination date or between two coupon determination dates. Accordingly, the coupons, if any, on the notes may be less than the return you could earn on another instrument linked to the indices that pays coupons based on the performance of the indices from the trade date to any coupon determination date or from coupon determination date to coupon determination date.

The Cash Settlement Amount Will Be Based Solely on the Lesser Performing Index

If the notes are not redeemed by us, the cash settlement amount will be based on the lesser performing index without regard to the performance of the other indices. As a result, you could lose all or some of your initial investment if the lesser performing index return is negative, even if there is an increase in the level of the other indices. This could be the case even if the other indices increased by an amount greater than the decrease in the lesser performing index.

The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors

When we refer to the market value of your notes, we mean the value that you could receive for your notes if you chose to sell them in the open market before the stated maturity date. A number of factors, many of which are beyond our control, will influence the market value of your notes, including:

- the levels of the indices;
- the volatility – i.e., the frequency and magnitude of changes – in the closing levels of the indices;
- the dividend rates of the index stocks;
- economic, financial, regulatory, political, military and other events that affect stock markets generally and the index stocks, and which may affect the closing levels of the indices;
- interest rates and yield rates in the market;
- the time remaining until your notes mature; and
- our creditworthiness and the creditworthiness of The Goldman Sachs Group, Inc., whether actual or perceived, and including actual or anticipated upgrades or downgrades in our credit ratings or the credit ratings of The Goldman Sachs Group, Inc. or changes in other credit measures.

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These factors, and many other factors, will influence the price you will receive if you sell your notes before maturity, including the price you may receive for your notes in any market making transaction. If you sell your notes before maturity, you may receive less than the face amount of your notes.

You cannot predict the future performance of the indices based on their historical performance. The actual performance of the indices over the life of the offered notes, the cash settlement amount paid on the stated maturity date, as well as the coupon payable, if any, on each coupon payment date, may bear little or no relation to the historical closing levels of the indices or to the hypothetical examples shown elsewhere in this prospectus supplement.

Your Notes May Not Have an Active Trading Market

Your notes will not be listed or displayed on any securities exchange or included in any interdealer market quotation system, and there may be little or no secondary market for your notes. Even if a secondary market for your notes develops, it may not provide significant liquidity and we expect that transaction costs in any secondary market would be high. As a result, the difference between bid and asked prices for your notes in any secondary market could be substantial.

If You Purchase Your Notes at a Premium to Face Amount, the Return on Your Investment Will Be Lower Than the Return on Notes Purchased at Face Amount and the Impact of Certain Key Terms of the Notes Will Be Negatively Affected

The cash settlement amount you will be paid for your notes on the stated maturity date or the amount we will pay you upon any early redemption of your notes will not be adjusted based on the issue price you pay for the notes. If you purchase notes at a price that differs from the face amount of the notes, then the return on your investment in such notes held to the stated maturity date or date of early redemption will differ from, and may be substantially less than, the return on notes purchased at face amount. If you purchase your notes at a premium to face amount and hold them to the stated maturity date or date of early redemption, the return on your investment in the notes will be lower than it would have been had you purchased the notes at face amount or a discount to face amount.

If the Levels of the Indices Change, the Market Value of Your Notes May Not Change in the Same Manner

The price of your notes may move differently than the performance of the indices. Changes in the levels of the indices may not result in a comparable change in the market value of your notes. Even if the closing level of each index is greater than or equal to 75% of its initial index level during some portion of the life of the notes, the market value of your notes may not reflect this. We discuss some of the reasons for this disparity under "— The Market Value of Your Notes May Be Influenced by Many Unpredictable Factors" above.

Anticipated Hedging Activities by Goldman Sachs or Our Distributors May Negatively Impact Investors in the Notes and Cause Our Interests and Those of Our Clients and Counterparties to be Contrary to Those of Investors in the Notes

Goldman Sachs expects to hedge our obligations under the notes by purchasing listed or over-the-counter options, futures and/or other instruments linked to the indices or the index stocks. Goldman Sachs also expects to adjust the hedge by, among other things, purchasing or selling any of the foregoing, and perhaps other instruments linked to the indices or the index stocks, at any time and from time to time, and to unwind the hedge by selling any of the foregoing on or before the determination date for your notes. Alternatively, Goldman Sachs may hedge all or part of our obligations under the notes with unaffiliated distributors of the notes which we expect will undertake similar market activity. Goldman Sachs may also enter into, adjust and unwind hedging transactions relating to other index-linked notes whose returns are linked to changes in the levels of the indices or the index stocks, as applicable.

In addition to entering into such transactions itself, or distributors entering into such transactions, Goldman Sachs may structure such transactions for its clients or counterparties, or otherwise advise or assist clients or counterparties in entering into such transactions. These activities may be undertaken to achieve a variety of objectives, including: permitting other purchasers of the notes or other securities to hedge their investment in whole or in part; facilitating transactions for other clients or counterparties that may have business objectives or investment strategies that are inconsistent with or contrary to those of

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investors in the notes; hedging the exposure of Goldman Sachs to the notes including any interest in the notes that it reacquires or retains as part of the offering process, through its market-making activities or otherwise; enabling Goldman Sachs to comply with its internal risk limits or otherwise manage firmwide, business unit or product risk; and/or enabling Goldman Sachs to take directional views as to relevant markets on behalf of itself or its clients or counterparties that are inconsistent with or contrary to the views and objectives of the investors in the notes.

Any of these hedging or other activities may adversely affect the levels of the indices — directly or indirectly by affecting the price of the index stocks — and therefore the market value of your notes and the amount we will pay on your notes, if any. In addition, you should expect that these transactions will cause Goldman Sachs or its clients, counterparties or distributors to have economic interests and incentives that do not align with, and that may be directly contrary to, those of an investor in the notes. Neither Goldman Sachs nor any distributor will have any obligation to take, refrain from taking or cease taking any action with respect to these transactions based on the potential effect on an investor in the notes, and may receive substantial returns on hedging or other activities while the value of your notes declines. In addition, if the distributor from which you purchase notes is to conduct hedging activities in connection with the notes, that distributor may otherwise profit in connection with such hedging activities and such profit, if any, will be in addition to the compensation that the distributor receives for the sale of the notes to you. You should be aware that the potential to earn fees in connection with hedging activities may create a further incentive for the distributor to sell the notes to you in addition to the compensation they would receive for the sale of the notes.

Goldman Sachs' Trading and Investment Activities for its Own Account or for its Clients, Could Negatively Impact Investors in the Notes

Goldman Sachs is a global investment banking, securities and investment management firm that provides a wide range of financial services to a substantial and diversified client base that includes corporations, financial institutions, governments and individuals. As such, it acts as an investor, investment banker, research provider, investment manager, investment advisor, market maker, trader, prime broker and lender. In those and other capacities, Goldman Sachs purchases, sells or holds a broad array of investments, actively trades securities, derivatives, loans, commodities, currencies, credit default swaps, indices, baskets and other financial instruments and products for its own account or for the accounts of its customers, and will have other direct or indirect interests, in the global fixed income, currency, commodity, equity, bank loan and other markets. Any of Goldman Sachs' financial market activities may, individually or in the aggregate, have an adverse effect on the market for your notes, and you should expect that the interests of Goldman Sachs or its clients or counterparties will at times be adverse to those of investors in the notes.

Goldman Sachs regularly offers a wide array of securities, financial instruments and other products into the marketplace, including existing or new products that are similar to your notes, or similar or linked to the indices or index stocks. Investors in the notes should expect that Goldman Sachs will offer securities, financial instruments, and other products that will compete with the notes for liquidity, research coverage or otherwise.

Goldman Sachs' Market-Making Activities Could Negatively Impact Investors in the Notes

Goldman Sachs actively makes markets in and trades financial instruments for its own account and for the accounts of customers. These financial instruments include debt and equity securities, currencies, commodities, bank loans, indices, baskets and other products. Goldman Sachs' activities include, among other things, executing large block trades and taking long and short positions directly and indirectly, through derivative instruments or otherwise. The securities and instruments in which Goldman Sachs takes positions, or expects to take positions, include securities and instruments of an index or index stocks, securities and instruments similar to or linked to the foregoing or the currencies in which they are denominated. Market making is an activity where Goldman Sachs buys and sells on behalf of customers, or for its own account, to satisfy the expected demand of customers. By its nature, market making involves facilitating transactions among market participants that have differing views of securities and instruments. As a result, you should expect that Goldman Sachs will take positions that are inconsistent with, or adverse to, the investment objectives of investors in the notes.

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If Goldman Sachs becomes a holder of any securities of the indices or index stocks in its capacity as a market-maker or otherwise, any actions that it takes in its capacity as securityholder, including voting or provision of consents, will not necessarily be aligned with, and may be inconsistent with, the interests of investors in the notes.

You Should Expect That Goldman Sachs Personnel Will Take Research Positions, or Otherwise Make Recommendations, Provide Investment Advice or Market Color or Encourage Trading Strategies That Might Negatively Impact Investors in the Notes

Goldman Sachs and its personnel, including its sales and trading, investment research and investment management personnel, regularly make investment recommendations, provide market color or trading ideas, or publish or express independent views in respect of a wide range of markets, issuers, securities and instruments. They regularly implement, or recommend to clients that they implement, various investment strategies relating to these markets, issuers, securities and instruments. These strategies include, for example, buying or selling credit protection against a default or other event involving an issuer or financial instrument. Any of these recommendations and views may be negative with respect to the indices or index stocks or other securities or instruments similar to or linked to the foregoing or result in trading strategies that have a negative impact on the market for any such securities or instruments, particularly in illiquid markets. In addition, you should expect that personnel in the trading and investing businesses of Goldman Sachs will have or develop independent views of the indices or index stocks, the relevant industry or other market trends, which may not be aligned with the views and objectives of investors in the notes.

Goldman Sachs Regularly Provides Services to, or Otherwise Has Business Relationships with, a Broad Client Base, Which May Include the Sponsors of an Index or the Issuers of the Index Stocks or Other Entities That Are Involved in the Transaction

Goldman Sachs regularly provides financial advisory, investment advisory and transactional services to a substantial and diversified client base, and you should assume that Goldman Sachs will, at present or in the future, provide such services or otherwise engage in transactions with, among others, the sponsors of the indices or the issuers of the index stocks, or transact in securities or instruments or with parties that are directly or indirectly related to the foregoing. These services could include making loans to or equity investments in those companies, providing financial advisory or other investment banking services, or issuing research reports. You should expect that Goldman Sachs, in providing such services, engaging in such transactions, or acting for its own account, may take actions that have direct or indirect effects on the indices or index stocks, as applicable, and that such actions could be adverse to the interests of investors in the notes. In addition, in connection with these activities, certain Goldman Sachs personnel may have access to confidential material non-public information about these parties that would not be disclosed to Goldman Sachs employees that were not working on such transactions as Goldman Sachs has established internal information barriers that are designed to preserve the confidentiality of non-public information. Therefore, any such confidential material non-public information would not be shared with Goldman Sachs employees involved in structuring, selling or making markets in the notes or with investors in the notes.

In this offering, as well as in all other circumstances in which Goldman Sachs receives any fees or other compensation in any form relating to services provided to or transactions with any other party, no accounting, offset or payment in respect of the notes will be required or made; Goldman Sachs will be entitled to retain all such fees and other amounts, and no fees or other compensation payable by any party or indirectly by holders of the notes will be reduced by reason of receipt by Goldman Sachs of any such other fees or other amounts.

The Offering of the Notes May Reduce an Existing Exposure of Goldman Sachs or Facilitate a Transaction or Position That Serves the Objectives of Goldman Sachs or Other Parties

A completed offering may reduce Goldman Sachs' existing exposure to the indices or index stocks, securities and instruments similar to or linked to the foregoing or the currencies in which they are denominated, including exposure gained through hedging transactions in anticipation of this offering. An offering of notes will effectively transfer a portion of Goldman Sachs' exposure (and indirectly transfer the exposure of Goldman Sachs' hedging or other counterparties) to investors in the notes.

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The terms of the offering (including the selection of the indices or index stocks, and the establishment of other transaction terms) may have been selected in order to serve the investment or other objectives of Goldman Sachs or another client or counterparty of Goldman Sachs. In such a case, Goldman Sachs would typically receive the input of other parties that are involved in or otherwise have an interest in the offering, transactions hedged by the offering, or related transactions. The incentives of these other parties would normally differ from and in many cases be contrary to those of investors in the notes.

Other Investors in the Notes May Not Have the Same Interests as You

Other investors in the notes are not required to take into account the interests of any other investor in exercising remedies or voting or other rights in their capacity as securityholders or in making requests or recommendations to Goldman Sachs as to the establishment of other transaction terms. The interests of other investors may, in some circumstances, be adverse to your interests. For example, certain investors may take short positions (directly or indirectly through derivative transactions) on assets that are the same or similar to your notes, index, index stocks or other similar securities, which may adversely impact the market for or value of your notes.

The Policies of an Index Sponsor and Changes that Affect an Index or the Index Stocks Comprising an Index, Could Affect the Coupons Payable on Your Notes, if Any, the Cash Settlement Amount on the Stated Maturity Date and the Market Value of Your Notes

The policies of an index sponsor concerning the calculation of the level of an index, additions, deletions or substitutions of the index stocks comprising such index, and the manner in which changes affecting such index stocks or their issuers, such as stock dividends, reorganizations or mergers, are reflected in the index level, could affect the level of such index and, therefore, the coupon payable on your notes, if any, on any coupon payment date and the market value of your notes before that date. The coupons payable on your notes, if any, and their market value could also be affected if an index sponsor changes these policies, for example, by changing the manner in which it calculates the index level, or if the index sponsor discontinues or suspends calculation or publication of such index level, in which case it may become difficult to determine the market value of your notes. If events such as these occur, the calculation agent — which initially will be GS&Co., our affiliate — may determine the applicable index levels on any such date — and thus the amount payable on any coupon payment date, if any, or the cash settlement amount on the stated maturity date— in a manner it considers appropriate, in its sole discretion. We describe the discretion that the calculation agent will have in determining the applicable index levels on any trading day, a coupon determination date or the determination date and the coupons payable on your notes, if any, or the cash settlement amount more fully under "Specific Terms of Your Notes — Discontinuance or Modification of an Index" and "— Role of Calculation Agent" below.

Except to the Extent The Goldman Sachs Group, Inc. Is One of the Companies Whose Common Stock Comprises the S&P 500® Index, There Is No Affiliation Between the Index Stock Issuers or the Index Sponsors and Us

The common stock of The Goldman Sachs Group, Inc. is one of the index stocks comprising the S&P 500® Index. We are not otherwise affiliated with the issuers of the index stocks or the index sponsors. As we have told you above, however, we or our affiliates may currently or from time to time in the future own securities of, or engage in business with, the index sponsors or the index stock issuers. Neither we nor any of our affiliates have participated in the preparation of any publicly available information or made any "due diligence" investigation or inquiry with respect to the indices or any of the other index stock issuers. You, as an investor in your notes, should make your own investigation into the indices and the index stock issuers. See "The Indices" below for additional information about each index.

Neither the index sponsors nor any of the other index stock issuers are involved in the offering of your notes in any way and none of them have any obligation of any sort with respect to your notes. Thus, neither the index sponsors nor any of the other index stock issuers have any obligation to take your interests into consideration for any reason, including in taking any corporate actions that might affect the market value of your notes.

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Your Notes Are Linked to the EURO STOXX 50® Index, Which Is Comprised of Index Stocks That Are Traded in a Foreign Currency But Not Adjusted to Reflect Their U.S. Dollar Value, And, Therefore, the Return on Your Notes Will Not Be Adjusted for Changes in the Foreign Currency Exchange Rate

Your notes are linked, in part, to the EURO STOXX 50® Index whose index stocks are traded in a foreign currency but not adjusted to reflect their U.S. dollar value. The amount payable on your notes will not be adjusted for changes in the euro/U.S. dollar exchange rate. The amount payable will be based, in part, upon the overall change in the level of the EURO STOXX 50® Index. Changes in foreign currency exchange rates, however, may reflect changes in the economy of the foreign countries in which the index's component stocks are listed that, in turn, may affect the level of the EURO STOXX 50® Index.

An Investment in the Offered Notes Is Subject to Risks Associated with Foreign Securities

The value of your notes is linked, in part, to an index that is comprised of stocks from one or more foreign securities markets. Investments linked to the value of foreign equity securities involve particular risks. Any foreign securities market may be less liquid, more volatile and affected by global or domestic market developments in a different way than are the U.S. securities market or other foreign securities markets. Both government intervention in a foreign securities market, either directly or indirectly, and cross-shareholdings in foreign companies, may affect trading prices and volumes in that market. Also, there is generally less publicly available information about foreign companies than about those U.S. companies that are subject to the reporting requirements of the U.S. Securities and Exchange Commission. Further, foreign companies are subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

The prices of securities in a foreign country are subject to political, economic, financial and social factors that are unique to such foreign country's geographical region. These factors include: recent changes, or the possibility of future changes, in the applicable foreign government's economic and fiscal policies; the possible implementation of, or changes in, currency exchange laws or other laws or restrictions applicable to foreign companies or investments in foreign equity securities; fluctuations, or the possibility of fluctuations, in currency exchange rates; and the possibility of outbreaks of hostility, political instability, natural disaster or adverse public health developments. The United Kingdom has voted to leave the European Union (popularly known as "Brexit"). The effect of Brexit is uncertain, and Brexit has and may continue to contribute to volatility in the prices of securities of companies located in Europe and currency exchange rates, including the valuation of the euro and British pound in particular. Any one of these factors, or the combination of more than one of these factors, could negatively affect such foreign securities market and the price of securities therein. Further, geographical regions may react to global factors in different ways, which may cause the prices of securities in a foreign securities market to fluctuate in a way that differs from those of securities in the U.S. securities market or other foreign securities markets. Foreign economies may also differ from the U.S. economy in important respects, including growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency, which may have a positive or negative effect on foreign securities prices.

The Return on Your Notes Will Not Reflect Any Dividends Paid on the Index Stocks

The applicable index sponsor calculates the level of an index by reference to the prices of the index stocks, without taking account of the value of dividends paid on those index stocks. Therefore, the return on your notes will not reflect the return you would realize if you actually owned the index stocks included in each index and received the dividends paid on those index stocks. You will not receive any dividends that may be paid on any of the index stocks by the index stock issuers. See "— You Have No Shareholder Rights or Rights to Receive Any Index Stock" below for additional information.

You Have No Shareholder Rights or Rights to Receive Any Index Stock

Investing in your notes will not make you a holder of any of the index stocks. Neither you nor any other holder or owner of your notes will have any rights with respect to the index stocks, including any voting rights, any right to receive dividends or other distributions, any rights to make a claim against the index stocks or any other rights of a holder of the index stocks. Your notes will be paid in cash, as will any coupon payments, and you will have no right to receive delivery of any index stocks.

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Past Index Performance is No Guide to Future Performance

The actual performance of the indices over the life of the notes, as well as the amount payable at maturity, if any, may bear little relation to the historical closing levels of the indices or to the hypothetical examples set forth elsewhere in this prospectus supplement. We cannot predict the future performance of the indices.

As Calculation Agent, GS&Co. Will Have the Authority to Make Determinations that Could Affect the Value of Your Notes

As calculation agent for your notes, GS&Co. will have discretion in making certain determinations that affect your notes, including determining: the closing levels of the indices on any coupon determination date, which we will use to determine the coupon, if any, we will pay on any applicable coupon payment date; the final index level of the lesser performing index on the determination date, which we will use to determine the amount we must pay on the stated maturity date; whether to postpone a coupon determination date or the determination date because of a market disruption event or a non-trading day; the coupon determination dates and the coupon payment dates. The calculation agent also has discretion in making certain adjustments relating to a discontinuation or modification of the indices. See "Specific Terms of Your Notes — Discontinuance or Modification of an Index" below. The exercise of this discretion by GS&Co. could adversely affect the value of your notes and may present GS&Co. with a conflict of interest. We may change the calculation agent at any time without notice and GS&Co. may resign as calculation agent at any time upon 60 days' written notice to us.

The Calculation Agent Can Postpone a Coupon Determination Date or the Determination Date, as the Case May Be, If a Market Disruption Event or a Non-Trading Day Occurs or is Continuing

If the calculation agent determines that, on a date that would otherwise be a coupon determination date or the determination date, a market disruption event has occurred or is continuing with respect to any index or that day is not a trading day with respect to any index, such coupon determination date or the determination date will be postponed as provided under "Specific Terms of Your Notes — Coupon Determination Dates" and "Specific Terms of Your Notes — Determination Dates", as applicable. In no case, however, will the coupon determination date or the determination date be postponed by more than three scheduled trading days for all indices from the originally scheduled coupon determination date or the originally scheduled determination date, as applicable. Moreover, if a coupon determination date or the determination date, as applicable, is postponed to the last possible day, but the market disruption event has not ceased by that day or that day is not a trading day, that day will nevertheless be the coupon determination date or the determination date, as applicable, for the corresponding coupon payment date or stated maturity date. In such a case, the calculation agent will determine the applicable closing levels or final index levels for such coupon determination date or the determination date based on the procedures described under "Specific Terms of Your Notes — Consequences of a Market Disruption Event or a Non-Trading Day" below.

Certain Considerations for Insurance Companies and Employee Benefit Plans

Any insurance company or fiduciary of a pension plan or other employee benefit plan that is subject to the prohibited transaction rules of the Employee Retirement Income Security Act of 1974, as amended, which we call "ERISA", or the Internal Revenue Code of 1986, as amended, including an IRA or a Keogh plan (or a governmental plan to which similar prohibitions apply), and that is considering purchasing the offered notes with the assets of the insurance company or the assets of such a plan, should consult with its counsel regarding whether the purchase or holding of the offered notes could become a "prohibited transaction" under ERISA, the Internal Revenue Code or any substantially similar prohibition in light of the representations a purchaser or holder in any of the above categories is deemed to make by purchasing and holding the offered notes. This is discussed in more detail under "Employee Retirement Income Security Act" below.

We May Sell an Additional Aggregate Face Amount of the Notes at a Different Issue Price

At our sole option, we may decide to sell an additional aggregate face amount of the notes subsequent to the date of this prospectus supplement. The issue price of the notes in the subsequent sale may differ substantially (higher or lower) from the issue price you paid as provided on the cover of this prospectus supplement.

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The Tax Consequences of an Investment in Your Notes Are Uncertain

The tax consequences of an investment in your notes are uncertain, both as to the timing and character of any inclusion in income in respect of your notes.

The Internal Revenue Service announced on December 7, 2007 that it is considering issuing guidance regarding the tax treatment of an instrument such as your notes, and any such guidance could adversely affect the value and the tax treatment of your notes. Among other things, the Internal Revenue Service may decide to require the holders to accrue ordinary income on a current basis and recognize ordinary income on payment at maturity, and could subject non-U.S. investors to withholding tax. Furthermore, in 2007, legislation was introduced in Congress that, if enacted, would have required holders that acquired instruments such as your notes after the bill was enacted to accrue interest income over the term of such instruments. It is not possible to predict whether a similar or identical bill will be enacted in the future, or whether any such bill would affect the tax treatment of your notes. We describe these developments in more detail under “Supplemental Discussion of Federal Income Tax Consequences – United States Holders – Possible Change in Law” below. You should consult your tax advisor about this matter. Except to the extent otherwise provided by law, GS Finance Corp. intends to continue treating the notes for U.S. federal income tax purposes in accordance with the treatment described under “Supplemental Discussion of Federal Income Tax Consequences” on page S-52 below unless and until such time as Congress, the Treasury Department or the Internal Revenue Service determine that some other treatment is more appropriate. Please also consult your tax advisor concerning the U.S. federal income tax and any other applicable tax consequences to you of owning your notes in your particular circumstances.

Foreign Account Tax Compliance Act (FATCA) Withholding May Apply to Payments on Your Notes, Including as a Result of the Failure of the Bank or Broker Through Which You Hold the Notes to Provide Information to Tax Authorities

Please see the discussion under “United States Taxation — Taxation of Debt Securities — Foreign Account Tax Compliance Act (FATCA) Withholding” in the accompanying prospectus for a description of the applicability of FATCA to payments made on your notes.

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SPECIFIC TERMS OF YOUR NOTES

We refer to the notes we are offering by this prospectus supplement as the "offered notes" or the "notes". Please note that in this prospectus supplement, references to "GS Finance Corp.", "we", "our" and "us" mean only GS Finance Corp. and do not include its subsidiaries or affiliates, references to "The Goldman Sachs Group, Inc.", our parent company, mean only The Goldman Sachs Group, Inc. and do not include its subsidiaries or affiliates and references to "Goldman Sachs" mean The Goldman Sachs Group, Inc. together with its consolidated subsidiaries and affiliates, including us. Also, references to the "accompanying prospectus" mean the accompanying prospectus, dated July 10, 2017, and references to the "accompanying prospectus supplement" mean the accompanying prospectus supplement, dated July 10, 2017, for Medium-Term Notes, Series E, in each case of GS Finance Corp. and The Goldman Sachs Group, Inc. Please note that in this section entitled "Specific Terms of Your Notes", references to "holders" mean those who own notes registered in their own names, on the books that we or the trustee maintain for this purpose, and not those who own beneficial interests in notes registered in street name or in notes issued in book-entry form through The Depository Trust Company. Please review the special considerations that apply to owners of beneficial interests in the accompanying prospectus, under "Legal Ownership and Book-Entry Issuance".

The offered notes are part of a series of debt securities, entitled "Medium-Term Notes, Series E", that we may issue under the indenture from time to time as described in the accompanying prospectus supplement and accompanying prospectus. The offered notes are also "indexed debt securities", as defined in the accompanying prospectus.

This prospectus supplement summarizes specific financial and other terms that apply to the offered notes, including your notes; terms that apply generally to all Series E medium-term notes are described in "Description of Notes We May Offer" in the accompanying prospectus supplement. The terms described here supplement those described in the accompanying prospectus supplement and the accompanying prospectus and, if the terms described here are inconsistent with those described there, the terms described here are controlling.

In addition to those terms described under "Summary Information" in this prospectus supplement, the following terms will apply to your notes:

Specified currency:

- U.S. dollars ("$")

Form of note:

- global form only: yes, at DTC
- non-global form available: no

Denominations: each note registered in the name of a holder must have a face amount of $1,000 or an integral multiple of $1,000 in excess thereof

Defeasance applies as follows:

- full defeasance: no
- covenant defeasance: no

Other terms:

- the default amount will be payable on any acceleration of the maturity of your notes as described under "— Special Calculation Provisions" below

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- a business day for your notes will not be the same as a business day for our other Series E medium-term notes, as described under "— Special Calculation Provisions" below
- a trading day for your notes will be as described under "— Special Calculation Provisions" below

Please note that the information about the settlement or trade date, issue price, discount or commission and net proceeds to GS Finance Corp. on the front cover page or elsewhere in this prospectus supplement relates only to the initial issuance and sale of the offered notes. We may decide to sell additional notes on one or more dates after the date of this prospectus supplement, at issue prices and with underwriting discounts and net proceeds that differ from the amounts set forth on the front cover page or elsewhere in this prospectus supplement. If you have purchased your notes in a market-making transaction after the initial issuance and sale of the offered notes, any such relevant information about the sale to you will be provided in a separate confirmation of sale.

We describe the terms of your notes in more detail below.

Index, Index Sponsor and Index Stocks

In this prospectus supplement, when we refer to an index, we mean either the S&P 500® Index, the EURO STOXX 50® Index or the Russell 2000® Index or the specified on the front cover page, or any successor index, as each may be modified, replaced or adjusted from time to time as described under "— Discontinuance or Modification of an Index" below. When we refer to an index sponsor as of any time, we mean the entity, including any successor sponsor that determines and publishes the applicable index as then in effect. When we refer to the index stocks of an index as of any time, we mean the stocks that comprise the index as then in effect, after giving effect to any additions, deletions or substitutions.

Payment of a Contingent Coupon

Subject to our redemption right, on each coupon payment date, for each $1,000 face amount of your notes, we will pay you an amount in cash equal to:

- if the closing level of each index on the related coupon determination date is greater than or equal to 75% of its initial index level, $23.875; or
- if the closing level of any index on the related coupon determination date is less than 75% of its initial index level, $0

Payment of Principal on Stated Maturity Date

Subject to our redemption right, for each $1,000 face amount of your notes, we will pay you on the stated maturity date an amount in cash equal to:

- if the index return of each index is greater than or equal to -25%, $1,000 plus the final coupon;
- if the index return of each index is greater than or equal to -40% but the index return of any index is less than -25%, $1,000. You will not receive a coupon; or
- if the index return of any index is less than -40%, the sum of (i) $1,000 plus (ii) the product of (a) the lesser performing index return times (b) $1,000.

With respect to each index, the index return is calculated by subtracting the initial index level from the final index level and dividing the result by the initial index level, with the quotient expressed as a percentage.

The lesser performing index is the index with the lowest index return. The lesser performing index return is the index return of the lesser performing index.

The initial index levels are 2,905.97 with respect to the S&P 500® Index, 3,433.15 with respect to the EURO STOXX 50® Index and 1,691.608 with respect to the Russell 2000® Index. With respect to each index, the calculation agent will determine the final index level, which will be the closing level of such index on the determination date. However, the calculation agent will have discretion to adjust the closing level on the determination date or to determine it in a different manner as described under " — Consequences of a Market Disruption Event or a Non-Trading Day" and "— Discontinuance or Modification of an Index" below.

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Stated Maturity Date

The stated maturity date is September 28, 2028, unless that day is not a business day, in which case the stated maturity date will be postponed to the next following business day. If the determination date is postponed as described under "— Determination Date" below, such postponement of the determination date will not postpone the stated maturity date.

Determination Date

The determination date will be the last coupon determination date, September 14, 2028, subject to adjustment as described under "— Coupon Determination Dates" below. If the stated maturity date is postponed due to a non-business day as described under "— Stated Maturity Date" above, such postponement of the stated maturity date will not postpone the determination date.

Coupon and Coupon Payment Dates

The coupons will be calculated and paid as described in this prospectus supplement.

The coupons on the offered notes will be paid on the coupon payment dates (the 28th day of each March, June, September and December, commencing in December 2018 and ending on the stated maturity date, unless, for any such coupon payment date, that day is not a business day, in which case such coupon payment date will be postponed to the next following business day). If a coupon determination date is postponed as described under "— Coupon Determination Dates" below, such postponement of the coupon determination date will not postpone the related coupon payment date.

Coupon Determination Dates

The coupon determination dates are the tenth scheduled trading day for all indices prior to each coupon payment date, unless the calculation agent determines that, with respect to any index, a market disruption event occurs or is continuing on that day or that day is not otherwise a trading day. If a coupon payment date is postponed due to a non-business day as described under "— Coupon and Coupon Payment Dates" above, such postponement of the coupon payment date will not postpone the related coupon determination date.

In the event the originally scheduled coupon determination date is a non-trading day with respect to any index, the coupon determination date will be the first day thereafter that is a trading day for all indices (the "first qualified coupon trading day") provided that no market disruption event occurs or is continuing with respect to an index on that day. If a market disruption event with respect to an index occurs or is continuing on the originally scheduled coupon determination date or the first qualified coupon trading day, the coupon determination date will be the first following trading day on which the calculation agent determines that each index has had at least one trading day (from and including the originally scheduled coupon determination date or the first qualified coupon trading date, as applicable) on which no market disruption event has occurred or is continuing and the closing level of each index for that coupon determination date will be determined on or prior to the postponed coupon determination date as set forth under "— Consequences of a Market Disruption Event or a Non-Trading Day" below. (In such case, the coupon determination date may differ from the date on which the level of an index is determined for the purpose of the calculations to be performed on the coupon determination date.) In no event, however, will the coupon determination date be postponed by more than three scheduled trading days for all indices from the originally scheduled coupon determination date either due to the occurrence of serial non-trading days or due to the occurrence of one or more market disruption events. (For the avoidance of doubt, a day that is a scheduled trading day for only one index will not count as one of the three scheduled trading days for this purpose.) On such last possible coupon determination date applicable to the relevant coupon payment date, if a market disruption event occurs or is continuing with respect to an index that has not yet had such a trading day on which no market disruption event has occurred or is continuing or if such last possible day is not a trading day with respect to such index, that day will nevertheless be the coupon determination date.

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Consequences of a Market Disruption Event or a Non-Trading Day

With respect to any index, if a market disruption event occurs or is continuing on a day that would otherwise be a coupon determination date (and the determination date in the case of the last coupon determination date), or such day is not a trading day, then such coupon determination date will be postponed as described under "— Coupon Determination Dates" above. If any coupon determination date (and the determination date in the case of the last coupon determination date) is postponed to the last possible date due to the occurrence of serial non-trading days, the level of each index will be the calculation agent's assessment of such level, in its sole discretion, on such last possible postponed coupon determination date (and the determination date in the case of the last coupon determination date).

If any coupon determination date (and the determination date in the case of the last coupon determination date) is postponed due to a market disruption event with respect to any index, the closing level of each index with respect to such coupon determination date (and the final index level with respect to the determination date) will be calculated based on (i) for any index that is not affected by a market disruption event on the applicable originally scheduled coupon determination date or the first qualified coupon trading day thereafter (if applicable), the closing level of the index on that date, (ii) for any index that is affected by a market disruption event on the applicable originally scheduled coupon determination date or the first qualified coupon trading day thereafter (if applicable), the closing level of the index on the first following trading day on which no market disruption event exists for such index and (iii) the calculation agent's assessment, in its sole discretion, of the level of any index on the last possible postponed coupon determination date with respect to such index as to which a market disruption event continues through the last possible postponed coupon determination date. As a result, this could result in the closing level on any coupon determination date (or final index level on the determination date) of each index being determined on different calendar dates.

For the avoidance of doubt, once the closing level for an index is determined for a coupon determination date (or the determination date in the case of the last coupon determination date), the occurrence of a later market disruption event or non-trading day will not alter such calculation.

Discontinuance or Modification of an Index

If an index sponsor discontinues publication of an index and such index sponsor or anyone else publishes a substitute index that the calculation agent determines is comparable to such index, or if the calculation agent designates a substitute index, then the calculation agent will determine the coupon payable, if any, on the relevant coupon payment date or the cash settlement amount on the stated maturity date, as applicable, by reference to the substitute index. We refer to any substitute index approved by the calculation agent as a successor index.

If the calculation agent determines on a coupon determination date or the determination date, as applicable, that the publication of an index is discontinued and there is no successor index, the calculation agent will determine the coupon or the cash settlement amount, as applicable, on the related coupon payment date or the stated maturity date, as applicable, by a computation methodology that the calculation agent determines will as closely as reasonably possible replicate such index.

If the calculation agent determines that an index, the index stocks comprising that index or the method of calculating that index is changed at any time in any respect — including any split or reverse split and any addition, deletion or substitution and any reweighting or rebalancing of the index or of the index stocks and whether the change is made by the index sponsor under its existing policies or following a modification of those policies, is due to the publication of a successor index, is due to events affecting one or more of the index stocks or their issuers or is due to any other reason — and is not otherwise reflected in the level of the index by the index sponsor pursuant to the then-current index methodology of the index, then the calculation agent will be permitted (but not required) to make such adjustments in such index or the method of its calculation as it believes are appropriate to ensure that the levels of such index used to determine the coupon or cash settlement amount, as applicable, on the related coupon payment date or the stated maturity date, as applicable, is equitable.

All determinations and adjustments to be made by the calculation agent with respect to an index may be made by the calculation agent in its sole discretion. The calculation agent is not obligated to make any such adjustments.

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Default Amount on Acceleration

If an event of default occurs and the maturity of your notes is accelerated, we will pay the default amount in respect of the principal of your notes at the maturity, instead of the amount payable on the stated maturity date as described earlier. We describe the default amount under "— Special Calculation Provisions" below.

For the purpose of determining whether the holders of our Series E medium-term notes, which include your notes, are entitled to take any action under the indenture, we will treat the outstanding face amount of each of your notes as the outstanding principal amount of that note. Although the terms of your notes differ from those of the other Series E medium-term notes, holders of specified percentages in principal amount of all Series E medium-term notes, together in some cases with other series of our debt securities, will be able to take action affecting all the Series E medium-term notes, including your notes, except with respect to certain Series E medium-term notes if the terms of such notes specify that the holders of specified percentages in principal amount of all of such notes must also consent to such action. This action may involve changing some of the terms that apply to the Series E medium-term notes, accelerating the maturity of the Series E medium-term notes after a default or waiving some of our obligations under the indenture. In addition, certain changes to the indenture and the notes that only affect certain debt securities may be made with the approval of holders of a majority in principal amount of such affected debt securities. We discuss these matters in the accompanying prospectus under "Description of Debt Securities We May Offer — Default, Remedies and Waiver of Default" and "— Modification of the Debt Indentures and Waiver of Covenants.

Manner of Payment

Any payment or delivery on your notes at maturity will be made to an account designated by the holder of your notes and approved by us, or at the office of the trustee in New York City, but only when your notes are surrendered to the trustee at that office. We also may make any payment or delivery in accordance with the applicable procedures of the depositary.

Modified Business Day

As described in the accompanying prospectus, any payment on your notes that would otherwise be due on a day that is not a business day may instead be paid on the next day that is a business day, with the same effect as if paid on the original due date. For your notes, however, the term business day may have a different meaning than it does for other Series E medium-term notes. We discuss this term under "— Special Calculation Provisions" below.

Role of Calculation Agent

The calculation agent in its sole discretion will make all determinations regarding each index, the coupon determination dates, the coupon payment dates, the regular record dates, the coupon, if any, on each coupon payment date, each index return, the closing levels of the indices on each coupon determination date, each final index level, the determination date, business days, trading days, postponement of a coupon payment date, the stated maturity date and the amount of cash payable on your notes at maturity. Absent manifest error, all determinations of the calculation agent will be final and binding on you and us, without any liability on the part of the calculation agent.

Please note that GS&Co., our affiliate, is currently serving as the calculation agent as of the date of this prospectus supplement. We may change the calculation agent for your notes at any time after the date of this prospectus supplement without notice and GS&Co. may resign as calculation agent at any time upon 60 days' written notice to us.

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Our Early Redemption Right

We may redeem your notes, at our option, in whole but not in part, on each coupon payment date commencing in March 2019 and ending in June 2028, for an amount equal to 100% of the face amount plus any coupon then due.

If we choose to exercise our early redemption right described in this prospectus supplement, we will notify the holder of your notes and the trustee by giving at least ten business days' prior notice. The day we give the notice, which will be a business day, will be the redemption notice date and the immediately following coupon payment date, which we will state in the redemption notice, will be the redemption date. We will not give a redemption notice that results in a redemption date later than the June 2028 coupon payment date.

If we give the holder a redemption notice, we will redeem the entire outstanding face amount of your notes as follows. On the redemption date, we will pay to the holder of record on the scheduled business day immediately preceding the redemption date, the redemption price in cash, together with any coupon then due, in the manner described under "Manner of Payment" above.

Special Calculation Provisions

Business Day

When we refer to a business day with respect to your notes, we mean a day that is a New York business day as described under "Description of Debt Securities We May Offer — Calculations of Interest on Debt Securities — Business Days" on page 21 in the accompanying prospectus. A day is a scheduled business day if, as of the trade date, such day is scheduled to be a New York business day.

Trading Day

When we refer to a trading day with respect to an index, we mean (i) with respect to the EURO STOXX 50® Index, a day on which such index is calculated and published by the index sponsor, regardless of whether one or more of the principal securities markets for the index stocks are closed on that day, if the index sponsor publishes the level of such index on that day and (ii) with respect to the S&P 500® Index and the Russell 2000® Index, a day on which the respective principal securities markets for all of the index stocks are open for trading, the index sponsor is open for business and such index is calculated and published by the index sponsor. A day is a scheduled trading day with respect to the EURO STOXX 50® Index if, as of the trade date, such index is expected to be calculated and published by such index sponsor on that day. A day is a scheduled trading day with respect to the S&P 500® Index or the Russell 2000® Index if, as of the trade date, the respective index sponsor is scheduled to be open for business, such index is expected to be calculated and published and the respective principal securities markets for all of its index stocks are scheduled to be open for trading on such day.

Closing Level

When we refer to the closing level of the Russell 2000® Index on any trading day, we mean the closing level of that index or any successor index reported by Bloomberg Financial Services, or any successor reporting service we may select, on such trading day for that index. Currently, whereas the index sponsor publishes the official closing level of the Russell 2000® Index to six decimal places, Bloomberg Financial Services reports the closing level of the Russell 2000® Index to fewer decimal places. As a result, the closing level of the Russell 2000® Index reported by Bloomberg Financial Services generally may be lower or higher than the official closing level of the Russell 2000® Index published by the index sponsor.

When we refer to the closing level for the S&P 500® Index or the EURO STOXX 50® Index on any trading day, we mean the official closing level of such index or any successor index published by the index sponsor on such trading day for such index.

Default Amount

The default amount for your notes on any day (except as provided in the last sentence under "—Default Quotation Period" below), will be an amount in the specified currency for the face amount of your notes, equal

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to the cost of having a qualified financial institution, of the kind and selected as described below, expressly assume all of our payment and other obligations with respect to your notes as of that day and as if no default or acceleration had occurred, or to undertake other obligations providing substantially equivalent economic value to you with respect to your notes. That cost will equal:

- the lowest amount that a qualified financial institution would charge to effect this assumption or undertaking, plus
- the reasonable expenses, including reasonable attorneys' fees, incurred by the holder of your notes in preparing any documentation necessary for this assumption or undertaking.

During the default quotation period for your notes, which we describe below, the holder and/or we or the calculation agent may request a qualified financial institution to provide a quotation of the amount it would charge to effect this assumption or undertaking. If either party obtains a quotation, it must notify the other party in writing of the quotation. The amount referred to in the first bullet point above will equal the lowest — or, if there is only one, the only — quotation obtained, and as to which notice is so given, during the default quotation period. With respect to any quotation, however, the party not obtaining the quotation may object, on reasonable and significant grounds, to the assumption or undertaking by the qualified financial institution providing the quotation and notify the other party in writing of those grounds within two business days after the last day of the default quotation period, in which case that quotation will be disregarded in determining the default amount.

Default Quotation Period

The default quotation period is the period beginning on the day the default amount first becomes due and ending on the third business day after that day, unless:

- no quotation of the kind referred to above is obtained, or
- every quotation of that kind obtained is objected to within five business days after the day the default amount first becomes due.

If either of these two events occurs, the default quotation period will continue until the third business day after the first business day on which prompt notice of a quotation is given as described above. If that quotation is objected to as described above within five business days after that first business day, however, the default quotation period will continue as described in the prior sentence and this sentence.

In any event, if the default quotation period and the subsequent two business day objection period have not ended before the determination date, then the default amount will equal the principal amount of your notes.

Qualified Financial Institutions

For the purpose of determining the default amount at any time, a qualified financial institution must be a financial institution organized under the laws of any jurisdiction in the United States of America, Europe or Japan, which at that time has outstanding debt obligations with a stated maturity of one year or less from the date of issue and that is, or whose securities are, rated either:

- A-1 or higher by Standard & Poor's Ratings Services or any successor, or any other comparable rating then used by that rating agency, or
- P-1 or higher by Moody's Investors Service, Inc. or any successor, or any other comparable rating then used by that rating agency.

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Market Disruption Event

- With respect to any given trading day, any of the following will be a market disruption event with respect to an index: a suspension, absence or material limitation of trading in index stocks constituting 20% or more, by weight, of the index on their respective primary markets, in each case for more than two consecutive hours of trading or during the one half hour before the close of trading in that market, as determined by the calculation agent in its sole discretion,
- a suspension, absence or material limitation of trading in option or futures contracts relating to the index or to index stocks constituting 20% or more, by weight, of such index in the respective primary markets for those contracts, in each case for more than two consecutive hours of trading or during the one-half hour before the close of trading in that market, as determined by the calculation agent in its sole discretion, or
- index stocks constituting 20% or more, by weight, of the index, or option or futures contracts, if available, relating to the index or to index stocks constituting 20% or more, by weight, of the index are not trading on what were the respective primary markets for those index stocks or contracts, as determined by the calculation agent in its sole discretion,

and, in the case of any of these events, the calculation agent determines in its sole discretion that the event could materially interfere with the ability of GS Finance Corp. or any of its affiliates or a similarly situated party to unwind all or a material portion of a hedge that could be effected with respect to the notes. For more information about hedging by GS Finance Corp. and/or any of its affiliates, see "Use of Proceeds" and "Hedging" below.

The following events will not be market disruption events:

- a limitation on the hours or numbers of days of trading, but only if the limitation results from an announced change in the regular business hours of the relevant market, and
- a decision to permanently discontinue trading in option or futures contracts relating to an index or to any index stock.

For this purpose, an "absence of trading" in the primary securities market on which an index stock, or on which option or futures contracts relating to an index or an index stock are traded will not include any time when that market is itself closed for trading under ordinary circumstances. In contrast, a suspension or limitation of trading in an index stock or in option or futures contracts, if available, relating to an index or an index stock in the primary market for that stock or those contracts, by reason of:

- a price change exceeding limits set by that market,
- an imbalance of orders relating to that index stock or those contracts, or
- a disparity in bid and ask quotes relating to that index stock or those contracts,

will constitute a suspension or material limitation of trading in that stock or those contracts in that market.

A market disruption event with respect to one index will not, by itself, constitute a market disruption event for the other unaffected index.

As is the case throughout this prospectus supplement, references to the index in this description of market disruption events includes any successor index as it may be modified, replaced or adjusted from time to time.

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USE OF PROCEEDS

We will lend the net proceeds from the sale of the offered notes to The Goldman Sachs Group, Inc. or its affiliates. The Goldman Sachs Group, Inc. will use the proceeds from such loans for the purposes we describe in the accompanying prospectus under "Use of Proceeds". We or our affiliates may also use those proceeds in transactions intended to hedge our obligations under the offered notes as described below.

HEDGING

In anticipation of the sale of the offered notes, we and/or our affiliates have entered into or expect to enter into hedging transactions involving purchases of listed or over-the-counter options, futures and other instruments linked to the indices or the index stocks on or before the trade date. In addition, from time to time after we issue the offered notes, we and/or our affiliates may enter into additional hedging transactions and to unwind those we have entered into, in connection with the offered notes and perhaps in connection with other index-linked notes we issue, some of which may have returns linked to the indices or the index stocks. Consequently, with regard to your notes, from time to time, we and/or our affiliates:

- expect to acquire, or dispose of positions in listed or over-the-counter options, futures or other instruments linked to the indices or some or all of the index stocks,
- may take or dispose of positions in the securities of the index stock issuers themselves,
- may take or dispose of positions in listed or over-the-counter options or other instruments based on indices designed to track the performance of the stock exchanges or other components of the equity markets, and /or
- may take short positions in the index stocks or other securities of the kind described above — i.e., we and/or our affiliates may sell securities of the kind that we do not own or that we borrow for delivery to purchaser.

We and/or our affiliates may acquire a long or short position in securities similar to your notes from time to time and may, in our or their sole discretion, hold or resell those securities.

In the future, we and/or our affiliates expect to close out hedge positions relating to the offered notes and perhaps relating to other notes with returns linked to the indices or the index stocks. We expect these steps to involve sales of instruments linked to the indices on or shortly before the final coupon determination date. These steps may also involve sales and/or purchases of some or all of the index stocks, or listed or over-the-counter options, futures or other instruments linked to the indices, some or all of the index stocks or indices designed to track the performance of the U.S., European, Asian or other stock exchanges or other components of the U.S., European, Asian or other equity markets or other components of such markets.

The hedging activity discussed above may adversely affect the market value of your notes from time to time and the amount we will pay on your notes at maturity. See "Additional Risk Factors Specific to Your Notes" above for a discussion of these adverse effects.

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THE INDICES

THE S&P 500® INDEX

The S&P 500® Index includes a representative sample of 500 companies in leading industries of the U.S. economy. The 500 companies are not the 500 largest companies listed on the NYSE and not all 500 companies are listed on the NYSE. S&P Dow Jones Indices LLC ("S&P") chooses companies for inclusion in the S&P 500® Index with an aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the U.S. equity market. Although the S&P 500® Index contains 500 constituent companies, at any one time it may contain greater than 500 constituent trading lines since some companies included in the S&P 500® Index prior to July 31, 2017 may be represented by multiple share class lines in the S&P 500® Index. The S&P 500® Index is calculated, maintained and published by S&P and is part of the S&P Dow Jones Indices family of indices. Additional information is available on the following websites: us.spindices.com/indices/equity/sp-500 and spdji.com/. We are not incorporating by reference the websites or any material they include in this prospectus supplement.

S&P intends for the S&P 500® Index to provide a performance benchmark for the large-cap U.S. equity markets. Constituent changes are made on an as-needed basis and there is no schedule for constituent reviews. Constituent changes are generally announced one to five business days prior to the change. Relevant criteria for additions to the S&P 500® Index that are employed by S&P include: the company proposed for addition should have an unadjusted company market capitalization of $6.1 billion or more (for spin-offs, eligibility is determined using when-issued prices, if available); using composite pricing and volume, the ratio of annual dollar value traded in the proposed constituent to float-adjusted market capitalization of that company should be 1.00 or greater and the stock should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date; the company must be a U.S. company (characterized as a Form 10-K filer with its U.S. portion of fixed assets and revenues constituting a plurality of the total and with a primary listing of the common stock on the NYSE, NYSE Arca, NYSE American (formerly NYSE MKT), NASDAQ Global Select Market, NASDAQ Select Market, NASDAQ Capital Market, Bats BZX, Bats BYX, Bats EDGA, Bats EDGX or IEX (each, an "eligible exchange")); the proposed constituent has a public float of 50% or more of its stock; the inclusion of the company will contribute to sector balance in the index relative to sector balance in the market in the relevant market capitalization range; financial viability (the sum of the most recent four consecutive quarters' Generally Accepted Accounting Principles (GAAP) earnings (net income excluding discontinued operations) should be positive as should the most recent quarter); and, for IPOs, the company must be traded on an eligible exchange for at least twelve months. In addition, constituents of the S&P MidCap 400® Index and the S&P SmallCap 600® Index can be added to the S&P 500® Index without meeting the financial viability, public float and/or liquidity eligibility criteria if the S&P Index Committee decides that such an addition will enhance the representativeness of the S&P 500® Index as a market benchmark. Certain types of organizational structures and securities are always excluded, including business development companies (BDCs), limited partnerships, master limited partnerships, limited liability companies (LLCs), OTC bulletin board issues, closed-end funds, ETFs, ETNs, royalty trusts, tracking stocks, preferred stock and convertible preferred stock, unit trusts, equity warrants, convertible bonds, investment trusts, rights and American depositary receipts (ADRs). Stocks are deleted from the S&P 500® Index when they are involved in mergers, acquisitions or significant restructurings such that they no longer meet the inclusion criteria, and when they substantially violate one or more of the addition criteria. Stocks that are delisted or moved to the pink sheets or the bulletin board are removed, and those that experience a trading halt may be retained or removed in S&P's discretion. S&P evaluates additions and deletions with a view to maintaining S&P 500® Index continuity.

For constituents included in the S&P 500® Index prior to July 31, 2017, all publicly listed multiple share class lines are included separately in the S&P 500® Index, subject to, in the case of any such share class line, that share class line satisfying the liquidity and float criteria discussed above and subject to certain exceptions. It is possible that one listed share class line of a company may be included in the S&P 500® Index while a second listed share class line of the same company is excluded. For companies that issue a second publicly traded share class to index share class holders, the newly issued share class line is considered for inclusion if the event is mandatory and the market capitalization of the distributed class is not considered to be de minimis.

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As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the S&P 500® Index. Constituents of the S&P 500® Index prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the S&P 500® Index. If an S&P 500® Index constituent reorganizes into a multiple share class line structure, that company will be reviewed for continued inclusion in the S&P 500® Index at the discretion of the S&P Index Committee.

As of September 25, 2018, the 500 companies included in the S&P 500® Index were divided into eleven Global Industry Classification Sectors. The Global Industry Classification Sectors include (with the approximate percentage currently included in such sectors indicated in parentheses): Communication Services (9.95%), Consumer Discretionary (10.23%), Consumer Staples (6.70%), Energy (6.07%), Financials (13.66%), Health Care (14.89%), Industrials (9.71%), Information Technology (20.87%), Materials (2.49%), Real Estate (2.65%) and Utilities (2.78%). (Sector designations are determined by the underlier sponsor using criteria it has selected or developed. Index sponsors may use very different standards for determining sector designations. In addition, many companies operate in a number of sectors, but are listed in only one sector and the basis on which that sector is selected may also differ. As a result, sector comparisons between indices with different index sponsors may reflect differences in methodology as well as actual differences in the sector composition of the indices.) As of the close of business on September 21, 2018, S&P and MSCI, Inc. updated the Global Industry Classification Sector structure. Among other things, the update broadened the Telecommunications Services sector and renamed it the Communication Services sector. The renamed sector includes the previously existing Telecommunication Services Industry group, as well as the Media Industry group, which was moved from the Consumer Discretionary sector and renamed the Media & Entertainment Industry group. The Media & Entertainment Industry group contains three industries: Media, Entertainment and Interactive Media & Services. The Media industry continues to consist of the Advertising, Broadcasting, Cable & Satellite and Publishing sub-industries. The Entertainment industry contains the Movies & Entertainment sub-industry (which includes online entertainment streaming companies in addition to companies previously classified in such industry prior to September 21, 2018) and the Interactive Home Entertainment sub-industry (which includes companies previously classified in the Home Entertainment Software sub-industry prior to September 21, 2018 (when the Home Entertainment Software sub-industry was a sub-industry in the Information Technology sector)), as well as producers of interactive gaming products, including mobile gaming applications). The Interactive Media & Services industry and sub-industry includes companies engaged in content and information creation or distribution through proprietary platforms, where revenues are derived primarily through pay-per-click advertisements, and includes search engines, social media and networking platforms, online classifieds and online review companies. The Global Industry Classification Sector structure changes are effective for the S&P 500® Index as of the open of business on September 24, 2018 to coincide with the September 2018 quarterly rebalancing.

Calculation of the S&P 500® Index

The S&P 500® Index is calculated using a base-weighted aggregative methodology. The value of the S&P 500® Index on any day for which an index value is published is determined by a fraction, the numerator of which is the aggregate of the market price of each stock in the S&P 500® Index times the number of shares of such stock included in the S&P 500® Index, and the denominator of which is the divisor, which is described more fully below. The "market value" of any index stock is the product of the market price per share of that stock times the number of the then-outstanding shares of such index stock that are then included in the S&P 500® Index .

The S&P 500® Index is also sometimes called a "base-weighted aggregative index" because of its use of a divisor. The "divisor" is a value calculated by S&P that is intended to maintain conformity in index values over time and is adjusted for all changes in the index stocks' share capital after the "base date" as described below. The level of the S&P 500® Index reflects the total market value of all index stocks relative to the S&P 500® Index's base date of 1941-43.

In addition, the S&P 500® Index is float-adjusted, meaning that the share counts used in calculating the S&P 500® Index reflect only those shares available to investors rather than all of a company's outstanding shares. S&P seeks to exclude shares held by certain shareholders concerned with the control of a company, a group that generally includes the following: officers and directors and related individuals whose holdings are publicly disclosed, private equity, venture capital, special equity firms, publicly traded

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companies that hold shares for control in another company, strategic partners, holders of restricted shares, employee stock ownership plans, employee and family trusts, foundations associated with the company, holders of unlisted share classes of stock, government entities at all levels (except government retirement or pension funds) and any individual person listed as a 5% or greater stakeholder in a company as reported in regulatory filings (collectively, "control holders"). To this end, S&P excludes all share-holdings (other than depositary banks, pension funds, mutual funds, exchange traded fund providers, 401(k) plans of the company, government retirement and pension funds, investment funds of insurance companies, asset managers and investment funds, independent foundations, savings plans and investment plans) with a position greater than 5% of the outstanding shares of a company from the float-adjusted share count to be used in S&P 500® Index calculations.

The exclusion is accomplished by calculating an Investable Weight Factor (IWF) for each stock that is part of the numerator of the float-adjusted index fraction described above:

IWF = (available float shares)/(total shares outstanding)

where available float shares is defined as total shares outstanding less shares held by control holders. In most cases, an IWF is reported to the nearest one percentage point. For companies with multiple share class lines, a separate IWF is calculated for each share class line.

Maintenance of the S&P 500® Index

In order to keep the S&P 500® Index comparable over time S&P engages in an index maintenance process. The S&P 500® Index maintenance process involves changing the constituents as discussed above, and also involves maintaining quality assurance processes and procedures, adjusting the number of shares used to calculate the S&P 500® Index, monitoring and completing the adjustments for company additions and deletions, adjusting for stock splits and stock dividends and adjusting for other corporate actions. In addition to its daily governance of indices and maintenance of the S&P 500® Index methodology, at least once within any 12 month period, the S&P Index Committee reviews the S&P 500® Index methodology to ensure the S&P 500® Index continues to achieve the stated objective, and that the data and methodology remain effective. The S&P Index Committee may at times consult with investors, market participants, security issuers included in or potentially included in the S&P 500® Index, or investment and financial experts.

Divisor Adjustments

The two types of adjustments primarily used by S&P are divisor adjustments and adjustments to the number of shares (including float adjustments) used to calculate the S&P 500® Index. Set forth below is a table of certain corporate events and their resulting effect on the divisor and the share count. If a corporate event requires an adjustment to the divisor, that event has the effect of altering the market value of the affected index stock and consequently of altering the aggregate market value of the index stocks following the event. In order that the level of the S&P 500® Index not be affected by the altered market value (which could be an increase or decrease) of the affected index stock, S&P generally derives a new divisor by dividing the post-event market value of the index stocks by the pre-event index value, which has the effect of reducing the S&P 500® Index's post-event value to the pre-event level.

Changes to the Number of Shares of a Constituent

The S&P 500® Index maintenance process also involves tracking the changes in the number of shares included for each of the index companies. The timing of adjustments to the number of shares depends on the type of event causing the change, and whether the change represents 5% or more of the total share count (for companies with multiple share class lines, the 5% threshold is based on each individual share class line rather than total company shares). Changes as a result of mergers or acquisitions are implemented when the transaction occurs. At S&P's discretion, however, de minimis merger and acquisition changes may be accumulated and implemented with the updates made at the quarterly share updates as described below. Changes in a constituent's total shares of 5% or more due to public offerings (which must be underwritten, have a publicly available prospectus or prospectus summary filed with the Securities and Exchange Commission and include a public confirmation that the offering has been completed) are implemented as soon as reasonably possible. Other changes of 5% or more are made weekly and are announced on Fridays for implementation after the close of trading on the following Friday.

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For changes of less than 5%, on the third Friday of the last month in each calendar quarter, S&P updates the share totals of companies in the S&P 500® Index as required by any changes in the number of shares outstanding. S&P implements a share / IWF freeze beginning after the market close on the Tuesday preceding the second Friday of each quarterly rebalancing month and ending after the market close on the third Friday of the quarterly rebalancing month. During this frozen period, shares and IWFs are not changed except for certain corporate action events (merger activity, stock splits and rights offerings).

Adjustments for Corporate Actions

There is a large range of corporate actions that may affect companies included in the S&P 500® Index. Certain corporate actions require S&P to recalculate the share count or the float adjustment or to make an adjustment to the divisor to prevent the value of the S&P 500® Index from changing as a result of the corporate action. This helps ensure that the movement of the S&P 500® Index does not reflect the corporate actions of individual companies in the S&P 500® Index.

Spin-Offs

As a general policy, a spin-off security is added to the S&P 500® Index at a zero price at the market close of the day before the ex-date (with no divisor adjustment). The spin-off security will remain in the S&P 500® Index if it meets all eligibility criteria. If the spin-off security is determined ineligible to remain in the S&P 500® Index, it will generally be removed after at least one day of regular way trading (with a divisor adjustment). If there is a gap between the ex-date and distribution date (or payable date), or if the spin-off security does not trade regular way on the ex-date, the spin-off security is kept in the S&P 500® Index until the spin-off security begins trading regular way.

Several additional types of corporate actions, and their related adjustments, are listed in the table below.

Corporate Action	Share Count Revision Required?	Divisor Adjustment Required?
Stock split	Yes – share count is revised to reflect new count.	No – share count and price changes are off-setting
Change in shares outstanding (secondary issuance, share repurchase and/or share buy-back)	Yes – share count is revised to reflect new count.	Yes
Special dividends	No	Yes – calculation assumes that share price drops by the amount of the dividend; divisor adjustment reflects this change in index market value
Change in IWF	No	Yes – divisor change reflects the change in market value caused by the change to an IWF
Company added to or deleted from the S&P 500® Index	No	Yes – divisor is adjusted by the net change in market value, calculated as the shares issued multiplied by the price paid
Rights Offering	No	Yes – divisor adjustment reflects increase in market capitalization (calculation assumes that offering is fully subscribed)

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Recalculation Policy

S&P reserves the right to recalculate and republish the S&P 500® Index at its discretion in the event one of the following issues has occurred: (1) incorrect or revised closing price of one or more constituent securities; (2) missed corporate event; (3) incorrect application of corporate action or index methodology; (4) late announcement of a corporate event; or (5) incorrect calculation or data entry error. The decision to recalculate the S&P 500® Index is made at the discretion of the index manager and/or index committee, as further discussed below. The potential market impact or disruption resulting from the potential recalculation is considered when making any such decision. In the event of an incorrect closing price, a missed corporate event or a misapplied corporate action, a late announcement of a corporate event, or an incorrect calculation or data entry error that is discovered within two trading days of its occurrence, the index manager may, at his or her discretion, recalculate the S&P 500® Index without involving the index committee. In the event any such event is discovered beyond the two trading day period, the index committee shall decide whether the S&P 500® Index should be recalculated. In the event of an incorrect application of the methodology that results in the incorrect composition and/or weighting of index constituents, the index committee shall determine whether or not to recalculate the S&P 500® Index following specified guidelines. In the event that the S&P 500® Index is recalculated, it shall be done within a reasonable timeframe following the detection and review of the issue.

Calculations and Pricing Disruptions

Closing levels for the S&P 500® Index are calculated by S&P based on the closing price of the individual constituents of the S&P 500® Index as set by their primary exchange. Closing prices are received by S&P from one of its third party vendors and verified by comparing them with prices from an alternative vendor. The vendors receive the closing price from the primary exchanges. Real-time intraday prices are calculated similarly without a second verification. Prices used for the calculation of real time index values are based on the “Consolidated Tape”. The Consolidated Tape is an aggregation of trades for each constituent over all regional exchanges and trading venues and includes the primary exchange. If there is a failure or interruption on one or more exchanges, real-time calculations will continue as long as the “Consolidated Tape” is operational.

If an interruption is not resolved prior to the market close, official closing prices will be determined by following the hierarchy set out in NYSE Rule 123C. A notice is published on the S&P website at spdji.com indicating any changes to the prices used in S&P 500® Index calculations. In extreme circumstances, S&P may decide to delay index adjustments or not publish the S&P 500® Index. Real-time indices are not restated.

Unexpected Exchange Closures

An unexpected market/exchange closure occurs when a market/exchange fully or partially fails to open or trading is temporarily halted. This can apply to a single exchange or to a market as a whole, when all of the primary exchanges are closed and/or not trading. Unexpected market/exchange closures are usually due to unforeseen circumstances, such as natural disasters, inclement weather, outages, or other events.

To a large degree, S&P is dependent on the exchanges to provide guidance in the event of an unexpected exchange closure. S&P’s decision making is dependent on exchange guidance regarding pricing and mandatory corporate actions.

NYSE Rule 123C provides closing contingency procedures for determining an official closing price for listed securities if the exchange is unable to conduct a closing transaction in one or more securities due to a system or technical issue.

3:00 PM ET is the deadline for an exchange to determine its plan of action regarding an outage scenario. As such, S&P also uses 3:00 PM ET as the cutoff.

If all major exchanges fail to open or unexpectedly halt trading intraday due to unforeseen circumstances, S&P will take the following actions:

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Market Disruption Prior to Open of Trading:

(i) If all exchanges indicate that trading will not open for a given day, S&P will treat the day as an unscheduled market holiday. The decision will be communicated to clients as soon as possible through the normal channels. Indices containing multiple markets will be calculated as normal, provided that at least one market is open that day. Indices which only contain closed markets will not be calculated.

(ii) If exchanges indicate that trading, although delayed, will open for a given day, S&P will begin index calculation when the exchanges open.

Market Disruption Intraday:

(i) If exchanges indicate that trading will not resume for a given day, the S&P 500® Index level will be calculated using prices determined by the exchanges based on NYSE Rule 123C. Intraday S&P 500® Index values will continue to use the last traded composite price until the primary exchange publishes official closing prices.

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The EURO STOXX 50® Index

The EURO STOXX 50® Index is a free-float market capitalization-weighted index of 50 European blue-chip stocks and was created by and is sponsored and maintained by STOXX Limited. Publication of the EURO STOXX 50® Index began on February 26, 1998, based on an initial index value of 1,000 at December 31, 1991. The 50 stocks included in the EURO STOXX 50® Index trade in Euros, and are allocated, based on their country of incorporation, primary listing and largest trading volume, to one of the following countries: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain, which we refer to collectively as the Eurozone. Companies allocated to a Eurozone country but not traded in Euros are not eligible for inclusion in the index. The level of the EURO STOXX 50® Index is disseminated on the STOXX Limited website. STOXX Limited is under no obligation to continue to publish the index and may discontinue publication of it at any time. Additional information regarding the EURO STOXX 50® Index may be obtained from the STOXX Limited website: stoxx.com. We are not incorporating by reference the website or any material it includes in this document.

The top ten constituent stocks of the EURO STOXX 50® Index as of September 4, 2018, by weight, are: Total S.A. (6.15%), SAP SE (4.78%), Siemens AG (4.04%), Sanofi (3.57%), Allianz SE (3.46%), LVMH Moët Hennessy Louis Vuitton SE (3.39%), Bayer AG (3.21%), ASML Holding N.V. (3.20%), Unilever N.V. (3.19%) and BASF SE (3.10%); constituent weights may be found at stoxx.com/download/indices/factsheets/SX5GT.pdf under “Factsheets and Methodologies” and are updated periodically.

As of September 4, 2018, the sixteen industry sectors which comprise the EURO STOXX 50® Index represent the following weights in the index: Automobiles & Parts (4.30%), Banks (12.50%), Chemicals (5.07%), Construction & Materials (3.85%), Food & Beverage (4.45%), Health Care (10.66%), Industrial Goods & Services (11.25%), Insurance (6.64%), Media (0.99%), Oil & Gas (7.92%), Personal & Household Goods (10.40%), Real Estate (1.05%), Retail (2.33%), Technology (9.13%), Telecommunications (4.54%) and Utilities (4.93%); industry weightings may be found at stoxx.com/download/indices/factsheets/SX5GT.pdf under “Factsheets and Methodologies” and are updated periodically. Percentages may not sum to 100% due to rounding. Sector designations are determined by the index sponsor using criteria it has selected or developed. Index sponsors may use very different standards for determining sector designations. In addition, many companies operate in a number of sectors, but are listed in only one sector and the basis on which that sector is selected may also differ. As a result, sector comparisons between indices with different index sponsors may reflect differences in methodology as well as actual differences in the sector composition of the indices.

As of September 4, 2018, the eight countries which comprise the EURO STOXX 50® Index represent the following weights in the index: Belgium (2.62%), Finland (1.16%), France (38.98%), Germany (31.80%), Ireland (1.04%), Italy (4.65%), Netherlands (10.99%) and Spain (8.76%); country weightings may be found at stoxx.com/download/indices/factsheets/SX5GT.pdf under “Factsheets and Methodologies” and are updated periodically.

EURO STOXX 50® Index Composition.

The EURO STOXX 50® Index is composed of 50 index stocks chosen by STOXX Limited from the 19 EURO STOXX Supersector indices, which represent the Eurozone portion of the STOXX Europe 600 Supersector indices. The 19 supersectors from which stocks are selected for the EURO STOXX 50® Index are Automobiles & Parts, Banks, Basic Resources, Chemicals, Construction & Materials, Financial Services, Food & Beverages, Health Care, Industrial Goods & Services, Insurance, Media, Oil & Gas, Personal & Household Goods, Real Estate, Retail, Technology, Telecommunications, Travel & Leisure and Utilities, although stocks from each of these supersectors are not necessarily included at a given time.

Component Selection

The composition of the EURO STOXX 50® Index is reviewed by STOXX Limited annually in September. Within each of the 19 EURO STOXX Supersector indices, the respective index component stocks are ranked by free-float market capitalization. The largest stocks are added to the selection list until the coverage is close to, but still less than, 60% of the free-float market capitalization of the corresponding EURO STOXX Total Market Index Supersector Index. If the next highest-ranked stock brings the coverage closer to 60% in absolute terms, then it is also added to the selection list. All remaining stocks that are

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current EURO STOXX 50® Index components are then added to the selection list. The stocks on the selection list are then ranked by free-float market capitalization. The 40 largest stocks on the selection list are chosen as index components. The remaining 10 stocks are then selected from the largest current stocks ranked between 41 and 60. If the number of index components is still below 50, then the largest remaining stocks on the selection list are added until the EURO STOXX 50® Index contains 50 stocks. In exceptional cases, the STOXX Limited Management Board may make additions and deletions to the selection list.

Ongoing Maintenance of Component Stocks

The component stocks of the EURO STOXX 50® Index are monitored on an ongoing monthly basis for deletion and quarterly basis for addition. Changes to the composition of the EURO STOXX 50® Index due to corporate actions (including mergers and takeovers, spin-offs, sector changes and bankruptcy) are announced immediately, implemented two trading days later and become effective on the next trading day after implementation.

The component stocks of the EURO STOXX 50® Index are subject to a “fast exit” rule. A component stock is deleted if it ranks 75 or below on the monthly selection list and it ranked 75 or below on the selection list of the previous month. The highest-ranked non-component stock will replace the exiting component stock. The EURO STOXX 50® Index is also subject to a “fast entry” rule. All stocks on the latest selection lists and initial public offering (IPO) stocks are reviewed for a fast-track addition on a quarterly basis. A stock is added if it qualifies for the latest blue-chip selection list generated at the end of February, May, August or November and if it ranks within the lower buffer (between 1 and 25) on the selection list. If added, the stock replaces the smallest component stock.

A deleted stock is replaced immediately to maintain the fixed number of stocks. The replacement is based on the latest monthly selection list. In the case of a merger or takeover where a component stock is involved, the original component stock is replaced by the new component stock. In the case of a spin-off, if the original stock was a component stock, then each spin-off stock qualifies for addition if it lies within the lower buffer (between 1 and 40) on the latest selection list. The largest qualifying spin-off stock replaces the original component stock, while the next qualifying spin-off stock replaces the lowest ranked component stock and likewise for other qualifying spin-off stocks.

The free float factors and outstanding number of shares for each index stock that STOXX Limited uses to calculate the EURO STOXX 50® Index, as described below, are reviewed, calculated and implemented on a quarterly basis and are fixed until the next quarterly review. Certain extraordinary adjustments to the free float factors and/or the number of outstanding shares are implemented and made effective more quickly. The timing depends on the magnitude of the change. Each component’s weight is capped at 10% of the EURO STOXX 50® Index’s total free float market capitalization. The free float factor reduces the index stock’s number of shares to the actual amount available on the market. All holdings that are larger than five percent of the total outstanding number of shares and held on a long-term basis are excluded from the index calculation (including, but not limited to, stock owned by the company itself, stock owned by governments, stock owned by certain individuals or families, and restricted shares).

Index Calculation

STOXX Limited calculates the EURO STOXX 50® Index using the “Laspeyres formula,” which measures the aggregate price changes in the index stocks against a fixed base quantity weight. The discussion below describes the “price return” calculation of the EURO STOXX 50® Index.

The formula for calculating the EURO STOXX 50® Index value can be expressed as follows:

$$\text{EURO STOXX 50}^{®}\text{ Index} = \frac{\text{Free Float Market Capitalization of the EURO STOXX 50}^{®}\text{ Index}}{\text{Divisor}}$$

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The "free float market capitalization of the EURO STOXX 50® Index" is equal to the sum of the product of the price, the number of shares, the free float factor and the weighting cap factor for each index stock as of the time the EURO STOXX 50® Index is being calculated. The index stocks trade in Euros and thus, no currency conversion is required. Where any index component stock price is unavailable on any trading day, the index sponsor will generally use the last reported price for such component stock.

In case the investability and tradability of the index and index based products is affected by an upcoming market or company event that is considered significant or "extreme" by the STOXX Management Board, the following actions or a combination of the following actions are taken. For all such changes a minimum notification period of two full trading days will be observed. The action scope may include but is not limited to:

- application of expert judgment for index component pricing data,
- adjustment of operational procedures,
- postponement of index adjustments,
- adjustment of selection lists,
- change of weights of index constituents by adjusting the number of shares, free-float factors or weighting cap-factors, or
- adjustment of index compositions.

EURO STOXX 50 Divisor

The EURO STOXX 50® Index is calculated using a divisor that helps to maintain the continuity of the index's value so that corporate actions do not artificially increase or decrease the level of the EURO STOXX 50® Index.

The divisor is calculated by starting with the previous divisor in effect for the EURO STOXX 50® Index (which we call the "original divisor value") and multiplying it by a fraction, the numerator of which is the previous free float market capitalization of the EURO STOXX 50® Index, plus or minus the difference between the closing market capitalization of the EURO STOXX 50® Index and the adjusted closing market capitalization of the EURO STOXX 50® Index, and the denominator of which is the previous free float market capitalization of the EURO STOXX 50.

The adjusted free float market capitalization is calculated for stocks of companies that have experienced a corporate action of the type described below as of the time the new divisor value is being calculated using the free float market capitalization calculated with adjusted closing prices, the new number of shares, and the new free float factor minus the free float market capitalization calculated with that stock's original closing price, number of shares, and free float factor, in each case as used in calculating the original divisor value. Errors in divisor calculation are corrected on an intraday basis if discovered on the same day the new divisor is effective. If the error is discovered later, the error is corrected on an intraday basis if feasible and only if the error is considered significant by the STOXX Limited Management Board.

Divisor Adjustments

STOXX Limited adjusts the divisor for the EURO STOXX 50® Index to maintain the continuity of the EURO STOXX 50® Index values across changes due to corporate actions. Changes in weights due to corporate actions are distributed proportionally across all index components and equal an investment into the portfolio. The following is a summary of the adjustments to any index stock made for corporate actions and the effect of such adjustments on the divisor, where shareholders of the index stock will receive "B" new shares for every "A" share held (where applicable) and assuming that the version of the index to which your notes are linked is the price return version. All adjusted prices consider withholding taxes based on the new shares being distributed, using "B * (1 – withholding tax where applicable)".

(1) Special cash dividend:

Adjusted price = closing price – dividend announced by the company * (1- withholding tax if applicable)

Divisor: decreases

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(2) Split and reverse split:

Adjusted price = closing price * A / B

New number of shares = old number of shares * B / A

Divisor: no change

(3) Rights offering:

Adjusted price = (closing price * A + subscription price * B) / (A + B)

New number of shares = old number of shares * (A + B) / A

Divisor: increases

If the subscription price is not available or if the subscription price is equal to or greater than the closing price on the day before the effective date, then no adjustment is made.

Extremely dilutive rights issues having a share ratio larger or equal to 2000% ($B/A \geq 20$) are treated as follows: STOXX will announce the deletion of the company from the index following the standard rules for index replacements if sufficient notice of two trading days before the ex-date can be given.

The company may enter the index again at the next periodic index review, but only after the new rights issue shares have been listed.

Extremely dilutive rights issues for which two trading days' notice before the ex-date cannot be given, and all highly dilutive rights issues having a share ratio larger or equal to 200% ($B/A>2$) are treated as follows:

- The rights issue shares are included into the index with a theoretical price on the ex-date;
- The rights issue shares must be listed on an eligible stock exchange and tradable starting on the ex-date, otherwise, only a price adjustment is made and the rights are not included;
- The rights issue shares will have the same parameters as the parent company;
- The rights issue shares will be removed at the close of the day they start to trade with traded price being available; and
- The number of shares and weighting factors will be increased after the new rights issue shares have been listed.

(4) Stock dividend:

Adjusted price = closing price * A / (A + B)

New number of shares = old number of shares * (A + B) / A

Divisor: no change

(5) Stock dividend from treasury stock if treated as extraordinary dividend:

Adjusted close = close – close * B / (A + B)

Divisor: decreases

(6) Stock dividend of another company:

Adjusted price = (closing price * A – price of other company * B) / A

Divisor: decreases

(7) Return of capital and share consolidation:

Adjusted price = [closing price – capital return announced by company * (1– withholding tax)] * A / B

New number of shares = old number of shares * B / A

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Divisor: decreases

(8) Repurchase of shares / self-tender:

Adjusted price = [(price before tender * old number of shares) – (tender price * number of tendered shares)] / (old number of shares – number of tendered shares)

New number of shares = old number of shares – number of tendered shares

Divisor: decreases

(9) Spin– off:

Adjusted price = (closing price * A – price of spin–off shares * B) / A

Divisor: decreases

(10) Combination stock distribution (dividend or split) and rights offering:

For this corporate action, the following additional assumptions apply:

Shareholders receive B new shares from the distribution and C new shares from the rights offering for every A share held; and

If A is not equal to one, all the following “new number of shares” formulae need to be divided by A.

If rights are applicable after stock distribution (one action applicable to another):

Adjusted price = [closing price * A + subscription price * C * (1 + B / A)] / [(A + B) * (1 + C / A)]

New number of shares = old number of shares * [(A + B) * (1 + C / A)] / A

Divisor: increases

If stock distribution is applicable after rights (one action applicable to another):

Adjusted price = (closing price * A + subscription price * C) / [(A + C) * (1 + B / A)]

New number of shares = old number of shares * [(A + C) * (1 + B / A)]

Divisor: increases

Stock distribution and rights (neither action is applicable to the other):

Adjusted price = (closing price * A + subscription price * C) / (A + B + C)

New number of shares = old number of shares * (A + B + C) / A

Divisor: increases

(11) Addition/deletion of a company

No price adjustments are made. The net change in market capitalization determines the divisor adjustment.

(12) Free float and shares changes

No price adjustments are made. The net change in market capitalization determines the divisor adjustment.

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The Russell 2000® Index

The Russell 2000® Index is sponsored by FTSE Russell ("Russell") and measures the composite price performance of stocks of 2,000 companies in the U.S. equity market. It is generally considered to be a "small-cap" index. Additional information about the Russell 2000® Index is available on the following website: ftse.com/analytics/factsheets/Home/Search#. We are not incorporating by reference the website or any material it includes in this prospectus supplement.

As of September 14, 2018, the 2,000 companies included in the Russell 2000® Index were divided into nine Russell Global Sectors. The Russell Global Sectors include (with the approximate percentage currently included in such sectors indicated in parentheses): Consumer Discretionary (15.03%), Consumer Staples (2.45%), Financial Services (24.81%), Health Care (15.71%), Materials & Processing (6.93%), Other Energy (4.44%), Producer Durables (13.60%), Technology (12.95%) and Utilities (4.07%). (Sector designations are determined by the index sponsor using criteria it has selected or developed. Index sponsors may use very different standards for determining sector designations. In addition, many companies operate in a number of sectors, but are listed in only one sector and the basis on which that sector is selected may also differ. As a result, sector comparisons between indices with different index sponsors may reflect differences in methodology as well as actual differences in the sector composition of the indices.)

The Russell 2000® Index includes approximately 2,000 of the smallest securities that form the Russell 3000® Index. The Russell 3000® Index is comprised of the 3,000 largest U.S. companies, or 98% based on market capitalization, of the investable U.S. equity market. The Russell 2000® Index is designed to track the performance of the small capitalization segment of the U.S. equity market.

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Selection of Constituent Stocks of the Russell 2000® Index

The Russell 2000® Index is a sub-index of the Russell 3000® Index. To be eligible for inclusion in the Russell 3000® Index, and, consequently, the Russell 2000® Index, a company's stocks must be listed on the rank day in May of a given year (the timetable is announced each spring) and Russell must have access to documentation verifying the company's eligibility for inclusion. Eligible initial public offerings ("IPOs") are added to Russell U.S. Indices quarterly, based on total market capitalization rankings within the market-adjusted capitalization breaks established during the most recent reconstitution. To be added to any Russell U.S. index during a quarter outside of reconstitution, IPOs must meet additional eligibility criteria.

A company is included in the U.S. equity markets and is eligible for inclusion in the Russell 3000® Index, and consequently, the Russell 2000® Index, if that company incorporates in the U.S., has its headquarters in the U.S. and also trades with the highest liquidity in the U.S. If a company does not satisfy all of the above criteria, it can still be included in the U.S. equity market if any one of the following home country indicators is in the United States: (i) country of incorporation, (ii) country of headquarters and (iii) country in which the company trades with the highest liquidity (as defined by a two-year average daily dollar trading volume from all exchanges within the country), and the primary location of that company's assets or its revenue, based on an average of two years of assets or revenues data, is also in the United States. In addition, if there is insufficient information to assign a company to the U.S. equity markets based on its assets or revenue, the company may nonetheless be assigned to the U.S. equity markets if the headquarters of the company is located in the United States or if the headquarters of the company is located in certain "benefit-driven incorporation countries", or "BDIs", and that company's most liquid stock exchange is in the United States. The BDI countries are Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Curaçao, Faroe Islands, Gibraltar, Guernsey, Isle of Man, Jersey, Liberia, Marshall Islands, Panama, Saba, Sint Eustatius, Sint Maarten and Turks and Caicos Islands. A U.S.-listed company is not eligible for inclusion within the U.S. equity market if it has been classified by Russell as a China N share on the rank date of the index reconstitution. A company will be considered a China N share if the following criteria are satisfied: (i) the company is incorporated outside of the People's Republic of China, (ii) the company is listed on the NYSE, the NASDAQ or the NYSE MKT, (iii) over 55% of the revenue or assets of the company are derived from the People's Republic of China, and (iv) the company is controlled by a mainland Chinese entity, company or individual (if the shareholder background cannot be determined with publicly available information, Russell will consider whether the establishment and origin of the company are in mainland China and whether the company is headquartered in mainland China). ADRs and ADSs are not eligible for inclusion in the Russell 2000® Index.

In addition, all securities eligible for inclusion in the Russell 3000® Index, and consequently, the Russell 2000® Index, must trade on an eligible exchange (BATS, IEX, NYSE, NYSE MKT, NYSE Arca and NASDAQ).

Exclusions from the Russell 2000® Index

Russell specifically excludes the following companies and securities from the Russell 2000® Index: (i) preferred and convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, installment receipts and trust receipts; (ii) royalty trusts, U.S. limited liability companies, closed-end investment companies, companies that are required to report Acquired Fund Fees and Expenses (as defined by the SEC), including business development companies, blank check companies, special-purpose acquisition companies and limited partnerships; (iii) companies with a total market capitalization less than $30 million; (iv) companies with only a small portion of their shares available in the marketplace (companies with 5% or less float); (v) bulletin board, pink sheets or over-the-counter traded securities, including securities for which prices are displayed on the FINRA ADF; (vi) real estate investment trusts and publicly traded partnerships that generate, or have historically generated, unrelated business taxable income and have not taken steps to block their unrelated business taxable income to equity holders; and (vii) companies with 5% or less of the company's voting rights in the hands of unrestricted shareholders (existing constituents that do not currently have more than 5% of the company's voting rights in the hands of unrestricted shareholders have until the September 2022 review to meet this requirement).

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Initial List of Eligible Securities

The primary criterion Russell uses to determine the initial list of securities eligible for the Russell 3000® Index and, consequently, the Russell 2000® Index, is total market capitalization, which is calculated by multiplying the total outstanding shares for a company by the market price as of the rank day for those securities being considered at annual reconstitution. IPOs may be added between constitutions as noted below. All common stock share classes are combined in determining a company's total shares outstanding. If multiple share classes have been combined, the number of total shares outstanding will be multiplied by the primary exchange close price and used to determine the company's total market capitalization. In cases where the common stock share classes act independently of each other (e.g., tracking stocks), each class is considered for inclusion separately. Stocks must have a closing price at or above $1.00 on their primary exchange or an eligible secondary exchange on the last trading day of May of each year to be eligible for inclusion in the Russell 2000® Index. In order to reduce unnecessary turnover, if an existing member's closing price is less than $1.00 on the rank day in May, it will be considered eligible if the average of the daily closing prices from their primary exchange during the 30 days prior to the rank day is equal to or greater than $1.00. If an existing member does not trade on the rank day, it must price at $1.00 or above on another eligible U.S. exchange to remain eligible.

Multiple Share Classes

If an eligible company trades under multiple share classes or if a company distributes shares of an additional share class to its existing shareholders through a mandatory corporate action, each share class will be reviewed independently for inclusion. Share classes in addition to the primary vehicle (the pricing vehicle) that have a total market capitalization larger than the smallest company in the Russell 3000E™ Index, an average daily dollar trading value that exceeds that of the global median, and a float greater than 5% of shares available in the market place are eligible for inclusion.

The pricing vehicle will generally be designated as the share class with the highest two-year trading volume as of the rank day. In the absence of two years' worth of data, all available data will be used for this calculation. If the difference between trading volumes for each share class is less than 20%, the share class with the most available shares outstanding will be used as the pricing vehicle. At least 100 day trading volume is necessary to consider the class as a pricing vehicle for existing members. New members will be analyzed on all available data, even if that data is for less than 100 days.

Annual Reconstitution

The Russell 2000® Index is reconstituted annually by Russell to reflect changes in the marketplace. The list of companies is ranked based on total market capitalization on the last trading day in May, with the actual reconstitution occurring on the final Friday of June each year, unless the final Friday in June is the 29th or 30th, in which case reconstitution will occur on the preceding Friday. A full calendar for reconstitution is made available each spring.

A company's total shares are multiplied by the primary exchange close price of the pricing vehicle and used to determine the company's total market capitalization for the purpose of ranking of companies and determination of index membership. If no volume exists on the primary exchange on the rank day, the last trade price from an eligible secondary exchange will be used where volume exists (using the lowest trade price above $1.00 if multiple secondary markets exist). The company's rank will be determined based on the cumulative market capitalization. As of the June 2016 reconstitution, any share class not qualifying for eligibility independently will not be aggregated with the pricing vehicle within the available shares calculation.

For mergers and spin-offs that are effective between the rank day and the Friday prior to annual reconstitution in June, the market capitalizations of the impacted securities are recalculated and membership is reevaluated as of the effective date of the corporate action. For corporate events that occur during the final week of reconstitution (during which reconstitution is finalized Friday after U.S. market close), market capitalizations and memberships will not be reevaluated. Non index members that have been considered ineligible as of rank day will not be reevaluated in the event of a subsequent corporate action that occurs between rank day and the reconstitution effective date.

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Index Calculation and Capitalization Adjustments

As a capitalization-weighted index, the Russell 2000® Index reflects changes in the capitalization, or market value, of the index stocks relative to the capitalization on a base date. This discussion describes the "price return" calculation of the Russell 2000® Index. The current Russell 2000® Index value is the compounded result of the cumulative daily (or monthly) return percentages, where the starting value of the Russell 2000® Index is equal to the base value (100) and base date (December 31, 1978). Returns between any two dates can then be derived by dividing the ending period index value (IV1) by the beginning period (IV0) index value, so that the return equals [(IV1 / IV0) –1]*100.

Constituent stocks of the Russell 2000® Index are weighted in the Russell 2000® Index by their free-float market capitalization, which is calculated by multiplying the primary closing price by the number of free-float shares. Free-float shares are shares that are available to the public for purchase as determined by Russell. Adjustments to shares are reviewed quarterly (including at reconstitution) and for major corporate actions such as mergers.

The following are excluded from free float: shares directly owned by state, regional, municipal and local governments (excluding shares held by independently managed pension schemes for governments); shares held by sovereign wealth funds where each holding is 10% or greater of the total number of shares in issue; shares held by directors, senior executives and managers of the company, and by their family and direct relations, and by companies with which they are affiliated; shares held within employee share plans; shares held by public companies or by non-listed subsidiaries of public companies; shares held by founders, promoters, former directors, founding venture capital and private equity firms, private companies and individuals (including employees) where the holding is 10% or greater of the total number of shares in issue; all shares where the holder is subject to a lock-in clause (for the duration of that clause, after which free float changes resulting from the expiration of a lock-in clause will be implemented at the next quarterly review subsequent to there being a minimum of 20 business days between the expiration date of such lock-in clause and the Tuesday before the first Friday of the review month; if the previously locked-in shares are sold by way of a corporate event (such as a secondary offering), any change to the free float will be applied T+2 following completion and therefore will not be subject to the minimum 20 business day rule); shares held by an investor, investment company or an investment fund that is actively participating in the management of a company or is holding shares for publicly announced strategic reasons, or has successfully placed a current member to the board of directors of a company; and shares that are subject to ongoing contractual agreements (such as swaps) where they would ordinarily be treated as restricted. In addition, while portfolio holdings such as pension funds, insurance funds or investment companies will generally not be considered as restricted from free float, where a single portfolio holding is 30% or greater it will be regarded as strategic and therefore restricted (and will remain restricted until the holding falls below 30%).

Corporate Actions Affecting the Russell 2000® Index

Russell adjusts the Russell 2000® Index on a daily basis in response to certain corporate actions and events. Therefore, a company's membership in the Russell 2000® Index and its weight in the Russell 2000® Index can be impacted by these corporate actions. The adjustment is applied based on sources of public information, including press releases and Securities and Exchange Commission filings. Prior to the completion of a corporate action or event, Russell estimates the effective date. Russell will then adjust the anticipated effective date based on public information until the date is considered final. Depending on the time on a given day that an action is determined to be final, Russell will generally either (1) apply the action before the open on the ex-date or (2) apply the action after providing appropriate notice. If Russell has confirmed the completion of a corporate action, scheduled to become effective subsequent to a rebalance, the event may be implemented in conjunction with the rebalance to limit turnover, provided appropriate notice can be given. Russell applies the following methodology guidelines when adjusting the Russell 2000® Index in response to corporate actions and events:

"No Replacement" Rule — Securities that are deleted from the Russell 2000® Index between reconstitution dates, for any reason (e.g., mergers, acquisitions or other similar corporate activity) are not replaced. Thus, the number of securities in the Russell 2000® Index over the past year will fluctuate according to corporate activity.

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Mergers and Acquisitions

Adjustments due to mergers and acquisitions are applied to the Russell 2000® Index after the action is determined to be final. In the event that a constituent is being acquired for cash or is delisted subsequent to an index review, such constituent will be removed from the Russell 2000® Index in conjunction with the index review, assuming that the action is determined to be final and a minimum of two days' notice can be provided.

Between constituents: When mergers and acquisitions take place between companies that are both constituents of a Russell index for cash, the target company is deleted and shares of the acquiring stock are increased according to the offer terms. When mergers and acquisitions take place between companies that are both constituents of a Russell index for stock, the target company is deleted from the Russell 2000® Index at the last traded price.

Between a constituent and a non-constituent: If the target company is a member of the Russell 2000® Index, it is deleted from the Russell 2000® Index and the acquiring company will be included initially in the Russell 2000® Index provided it is eligible in all other respects at the time of the merger, regardless of previous eligibility screenings. If the acquiring company is deemed eligible it will be added to the Russell 2000® Index on the effective date and the opening price will be calculated using the offer terms.

Given sufficient market hours after the confirmation of a merger or acquisition, Russell effects the action after the close on the last day of trading of the target company, or at an appropriate time once the transaction has been deemed to be final.

Rights Offerings — Rights offered to shareholders are reflected in the Russell 2000® Index only if the subscription price of the rights is at a discount to the market price of the stock. Provided that Russell has been alerted to the rights offer prior to the ex-date, it will adjust the price of the stock for the value of the rights and increased shares according to the terms of the offering before the open on the ex-date.

Spin-offs— Spun-off companies are added to the parent company's index if the parent company's market value is reduced simultaneously per the spin-off valuation. Spun-off companies are added to the Russell 2000® Index at the same time as they are spun-off from their parent company on the ex-date of the distribution.

Initial Public Offerings — Eligible IPOs are added to the Russell 2000® Index based on total market capitalization ranking within the market-adjusted capitalization breaks established at the most recent annual reconstitution.
An IPO of additional share classes will be considered for eligibility and must meet the same eligibility criteria for all other multiple share classes. If at the time of the IPO the additional share class does not meet the eligibility criteria for separate index membership, it will not be added to the Russell 2000® Index and will subsequently be reviewed for index membership during the next annual reconstitution.
Once IPO additions have been announced, an IPO may be added to the Russell 2000® Index prior to the previously announced schedule, if a corporate action has deemed this to be appropriate and notice can be provided (e.g. an index member automatically receives shares via a stock distribution into a projected IPO add).

Tender Offers — A company acquired as a result of a tender offer is removed when (i) (a) offer acceptances reach 90%; (b) shareholders have validly tendered and the shares have been irrevocably accepted for payment; and (c) all pertinent offer conditions have been reasonably met and the acquirer has not explicitly stated that it does not intend to acquire the remaining shares; (ii) where offer acceptances are below 90%, there is reason to believe that the remaining free float is under 5% based on information available at the time; or (iii) following completion of the offer the acquirer has stated intent to finalize the acquisition via a short-form merger, squeeze-out, top-up option or any other compulsory mechanism.

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Where the conditions for index deletion are not met, Russell may implement a free float change based on the reported acceptance results at the expiration of the initial, subsequent or final offer period where (i) the minimum acceptance level as stipulated by the acquiror is met; (ii) shareholders have validly tendered and the shares have been irrevocably accepted for payment; (iii) all pertinent offer conditions have been reasonably met and (iv) the change to the current float factor is greater than 3%. A minimum two day notice period of the change is generally provided. If the offer includes a stock consideration, the acquiring company's shares will be increased proportionate to the free float change of the target company. If the target company's free float change is greater than 3%, the associated change to the acquiring company's shares will be implemented regardless of size. Additionally, if the change to the target company is less than 3%, then no change will be implemented to the target or the acquiring company at the time of the event, regardless of any change to the acquiring company's shares. The target company will then be deleted as a second-step, if the conditions for deletion are achieved at the expiration of a subsequent offer period.

Delisted and Suspended Stocks — A stock will be deleted as a constituent if it is delisted from all eligible exchanges, becomes bankrupt, files for bankruptcy protection, is insolvent or is liquidated, or where evidence of a change in circumstances makes it ineligible for index inclusion. If, however, a stock is suspended, Russell will determine its treatment as follows:

- if a constituent is declared bankrupt without any indication of compensation to shareholders, the last traded price will be adjusted to zero value and the constituent will be removed from the Russell 2000® Index with T+2 notice;
- in all other cases, a constituent will continue to be included in the Russell 2000® Index for a period of up to 20 business days at its last traded price;
- if a constituent continues to be suspended at the end of the 20 business day period, it will be subject to review and a decision will be taken to either allow the constituent to remain in the Russell 2000® Index for a further period of up to 20 business days or to remove it at zero value. In making this determination, Russell will take into account the stated reasons for the suspension. These reasons may include announcements made by the company regarding a pending acquisition or restructuring, and any stated intentions regarding a date for the resumption of trading. This procedure will be repeated at successive 20 business day intervals thereafter until either trading recommences or the suspension period reaches 80 business days;
- if the suspension period reaches 80 business days, Russell will provide notice that the constituent will be removed at zero value following the expiry of at least 40 business days;
- in certain limited circumstances where the index weight of the constituent is significant and Russell determines that a market-related value can be established for the suspended constituent, for example because similar company securities continue to trade, deletion may take place at the market-related value instead. In such circumstances, Russell will set out its rationale for the proposed treatment of the constituent at the end of the 80 business day period;
- if, following the end of the 80 business day period, a suspended constituent resumes trading before the Wednesday before the first Friday of March, June, September or December, the deletion notice will be rescinded and the constituent will be retained in the Russell 2000® Index. If the constituent resumes trading after these dates but before the review effective date, the constituent will continue to be removed from the Russell 2000® Index as previously announced but in these circumstances the deletion may instead be implemented at market value; and
- if a constituent has been removed from the Russell 2000® Index and trading is subsequently restored, the constituent will only be re-considered for inclusion after a period of 12 months from its deletion. For the purposes of index eligibility it will be treated as a new issue.

Bankruptcy and Voluntary Liquidations — Companies that file for a Chapter 7 liquidation bankruptcy or have filed a liquidation plan will be removed from the Russell 2000® Index at the time of the bankruptcy filing (except when shareholder approval is required to finalize the liquidation plan, in which case the company will be removed once shareholder approval has been granted); whereas companies filing for a Chapter 11 reorganization bankruptcy will remain a member of the Russell 2000® Index, unless the company is delisted from the primary exchange, in which case normal delisting rules apply. If a company files for bankruptcy, is delisted and it can be confirmed that it will not trade on any market, including OTC, Russell may remove the stock at a nominal price of $0.0001.

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Stock Distributions and distributions in specie— A price adjustment for stock distributions is applied on the ex-date of the distribution. Where Russell is able to value a distribution in specie prior to the ex-date, a price adjustment is made to the company paying the dividend at the open on the ex-date. If no valuation of the distribution exists prior to the ex-date, no price adjustment is applied. Where the company whose holders are receiving the distribution is an index member, its shares will be increased according to the terms of the distribution. If such company is not an index member, the distributed shares will be added to the Russell 2000® Index until they have been settled and have listed, at which point they will be removed at the last traded price giving appropriate notice.

Special Cash Dividends — If a constituent pays out a special cash dividend, the price of the stock is adjusted to deduct the dividend amount before the open on the ex-date. No adjustment for regular cash dividends is made in the price return calculation of the Russell 2000® Index.

Updates to Shares Outstanding and Free Float — Russell reviews the Russell 2000® Index quarterly for updates to shares outstanding and to free floats used in calculating the Russell 2000® Index. The changes are implemented quarterly in March, June, September and December after the close on the third Friday of such month. The June reconstitution will be implemented on the last Friday of June (unless the last Friday occurs on the 29th or 30th of the month, in which case reconstitution will occur on the Friday prior).

In March, September and December shares outstanding and free floats are updated to reflect (i) changes greater than 1% for cumulative shares in issue changes and (ii) changes greater than 3% for cumulative free float changes. In addition, a constituent with a free float of 15% or below will not be subject to the 3% change threshold and will instead be updated if the change is greater than 1%. Updates to shares outstanding and free floats will be implemented each June regardless of size (i.e., the percentage change thresholds above will not be applied). Russell implements the June updates using data sourced primarily from the companies' publicly available information filed with the Securities and Exchange Commission.

Outside of the quarterly update cycle, outstanding shares and free float will be updated with at least two days' notice if prompted by primary or secondary offerings if (i) there is a USD $1 billion investable market capitalization change related to a primary/secondary offering or (ii) there is a resultant 5% change in index shares related to a primary or secondary offering and a USD $250 million investable market capitalization change. These changes are implemented after the close on the day that the subscription period closes, assuming two days' notice can be provided. If two days' notice cannot be provided prior to the end of the subscription period, the change will still proceed with two days' notice and will be implemented at the earliest opportunity. If discovery of the event occurs more than two days after the close of the subscription period, the changes are deferred until the quarterly review cycle.

If a company distributes shares of an additional share class to its existing shareholders through a mandatory corporate action, the additional share class will be evaluated for separate index membership. The new share class will be deemed eligible if the market capitalization of the distributed shares meets the minimum size requirement (the market capitalization of the smallest member of the Russell 3000E Index from the previous rebalance as adjusted for performance to date). If the additional share class is not eligible at the time of distribution, it will not be added to the Russell 2000® Index.

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Historical Closing Levels of the Indices

The closing levels of the indices have fluctuated in the past and may, in the future, experience significant fluctuations. Any historical upward or downward trend in the closing level of any index during the period shown below is not an indication that such index is more or less likely to increase or decrease at any time during the life of your notes.

You should not take the historical closing levels of an index as an indication of the future performance of an index. We cannot give you any assurance that the future performance of any index or the index stocks will result in you receiving any coupon payments or receiving the outstanding face amount of your notes on the stated maturity date.

Neither we nor any of our affiliates make any representation to you as to the performance of the indices. Before investing in the offered notes, you should consult publicly available information to determine the relevant index levels between the date of this prospectus supplement and the date of your purchase of the offered notes. The actual performance of an index over the life of the offered notes, as well as the cash settlement amount at maturity may bear little relation to the historical levels shown below.

The graphs below show the daily historical closing levels of each index from September 26, 2008 through September 26, 2018. We obtained the levels in the graphs below from Bloomberg Financial Services, without independent verification. Although the official closing levels of the Russell 2000® Index are published to six decimal places by the index sponsor, Bloomberg Financial Services reports the levels of the Russell 2000® Index to fewer decimal places.

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Historical Performance of the S&P 500® Index

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Historical Performance of EURO STOXX 50® Index

Historical Performance of the Russell 2000® Index

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SUPPLEMENTAL DISCUSSION OF FEDERAL INCOME TAX CONSEQUENCES

The following section supplements the discussion of U.S. federal income taxation in the accompanying prospectus. The following section is the opinion of Sidley Austin llp, counsel to GS Finance Corp. and The Goldman Sachs Group, Inc. In addition, it is the opinion of Sidley Austin llp that the characterization of the notes for U.S. federal income tax purposes that will be required under the terms of the notes, as discussed below, is a reasonable interpretation of current law.

This section does not apply to you if you are a member of a class of holders subject to special rules, such as:

- a dealer in securities or currencies;
- a trader in securities that elects to use a mark-to-market method of accounting for your securities holdings;
- a bank;
- a life insurance company;
- a regulated investment company;
- an accrual method taxpayer subject to special tax accounting rules as a result of its use of financial statements;
- a tax exempt organization;
- a partnership;
- a person that owns a note as a hedge or that is hedged against interest rate risks;
- a person that owns a note as part of a straddle or conversion transaction for tax purposes; or
- a United States holder (as defined below) whose functional currency for tax purposes is not the U.S. dollar.

Although this section is based on the U.S. Internal Revenue Code of 1986, as amended, its legislative history, existing and proposed regulations under the Internal Revenue Code, published rulings and court decisions, all as currently in effect, no statutory, judicial or administrative authority directly discusses how your notes should be treated for U.S. federal income tax purposes, and as a result, the U.S. federal income tax consequences of your investment in your notes are uncertain. Moreover, these laws are subject to change, possibly on a retroactive basis.

You should consult your tax advisor concerning the U.S. federal income tax and other tax consequences of your investment in the notes, including the application of state, local or other tax laws and the possible effects of changes in federal or other tax laws.

United States Holders

This section applies to you only if you are a United States holder that holds your notes as a capital asset for tax purposes. You are a United States holder if you are a beneficial owner of a note and you are:

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- a citizen or resident of the United States;
- a domestic corporation;
- an estate whose income is subject to U.S. federal income tax regardless of its source; or
- a trust if a United States court can exercise primary supervision over the trust's administration and one or more United States persons are authorized to control all substantial decisions of the trust.

Tax Treatment. You will be obligated pursuant to the terms of the notes — in the absence of a change in law, an administrative determination or a judicial ruling to the contrary — to characterize your notes for all tax purposes as income-bearing pre-paid derivative contracts in respect of the indices. Except as otherwise stated below, the discussion below assumes that the notes will be so treated.

Coupon payments that you receive should be included in ordinary income at the time you receive the payment or when the payment accrues, in accordance with your regular method of accounting for U.S. federal income tax purposes.

Upon the sale, exchange, redemption or maturity of your notes, you should recognize capital gain or loss equal to the difference between the amount realized on the sale, exchange, redemption or maturity (excluding any amounts attributable to accrued and unpaid coupon payments, which will be taxable as described above) and your tax basis in your notes. Your tax basis in your notes will generally be equal to the amount that you paid for the notes. Such capital gain or loss should generally be short-term capital gain or loss if you hold the notes for one year or less, and should be long-term capital gain or loss if you hold the notes for more than one year. Short-term capital gains are generally subject to tax at the marginal tax rates applicable to ordinary income.

No statutory, judicial or administrative authority directly discusses how your notes should be treated for U.S. federal income tax purposes. As a result, the U.S. federal income tax consequences of your investment in the notes are uncertain and alternative characterizations are possible. Accordingly, we urge you to consult your tax advisor in determining the tax consequences of an investment in your notes in your particular circumstances, including the application of state, local or other tax laws and the possible effects of changes in federal or other tax laws.

Alternative Treatments. There is no judicial or administrative authority discussing how your notes should be treated for U.S. federal income tax purposes. Therefore, the Internal Revenue Service might assert that a treatment other than that described above is more appropriate. For example, the Internal Revenue Service could treat your notes as a single debt instrument subject to special rules governing contingent payment debt instruments.

Under those rules, the amount of interest you are required to take into account for each accrual period would be determined by constructing a projected payment schedule for the notes and applying rules similar to those for accruing original issue discount on a hypothetical noncontingent debt instrument with that projected payment schedule. This method is applied by first determining the comparable yield — i.e., the yield at which we would issue a noncontingent fixed rate debt instrument with terms and conditions similar to your notes — and then determining a payment schedule as of the applicable original issue date that would produce the comparable yield. These rules may have the effect of requiring you to include interest in income in respect of your notes prior to your receipt of cash attributable to that income.

If the rules governing contingent payment debt instruments apply, any income you recognize upon the sale, exchange, redemption or maturity of your notes would be treated as ordinary interest income. Any loss you recognize at that time would be treated as ordinary loss to the extent of interest you included as income in the current or previous taxable years in respect of your notes, and, thereafter, as capital loss.

If the rules governing contingent payment debt instruments apply, special rules would apply to persons who purchase a note at other than the adjusted issue price as determined for tax purposes.

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It is possible that the Internal Revenue Service could assert that your notes should generally be characterized as described above, except that (1) the gain you recognize upon the sale, exchange, redemption or maturity of your notes should be treated as ordinary income or (2) you should not include the coupon payments in income as you receive them but instead you should reduce your basis in your notes by the amount of coupon payments that you receive. It is also possible that the Internal Revenue Service could seek to characterize your notes in a manner that results in tax consequences to you different from those described above.

It is also possible that the Internal Revenue Service could seek to characterize your notes as notional principal contracts. It is also possible that the coupon payments would not be treated as either ordinary income or interest for U.S. federal income tax purposes, but instead would be treated in some other manner.

You should consult your tax advisor as to possible alternative characterizations of your notes for U.S. federal income tax purposes.

Possible Change in Law

In 2007, legislation was introduced in Congress that, if enacted, would have required holders that acquired instruments such as your notes after the bill was enacted to accrue interest income over the term of such instruments. It is not possible to predict whether a similar or identical bill will be enacted in the future, or whether any such bill would affect the tax treatment of your notes.

In addition, on December 7, 2007, the Internal Revenue Service released a notice stating that the Internal Revenue Service and the Treasury Department are actively considering issuing guidance regarding the proper U.S. federal income tax treatment of an instrument such as the offered notes including whether the holders should be required to accrue ordinary income on a current basis and whether gain or loss should be ordinary or capital. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the notes will ultimately be required to accrue income currently and this could be applied on a retroactive basis. The Internal Revenue Service and the Treasury Department are also considering other relevant issues, including whether foreign holders of such instruments should be subject to withholding tax on any deemed income accruals, and whether the special "constructive ownership rules" of Section 1260 of the Internal Revenue Code might be applied to such instruments. Except to the extent otherwise provided by law, GS Finance Corp. intends to continue treating the notes for U.S. federal income tax purposes in accordance with the treatment described above unless and until such time as Congress, the Treasury Department or the Internal Revenue Service determine that some other treatment is more appropriate.

It is impossible to predict what any such legislation or administrative or regulatory guidance might provide, and whether the effective date of any legislation or guidance will affect notes that were issued before the date that such legislation or guidance is issued. You are urged to consult your tax advisor as to the possibility that any legislative or administrative action may adversely affect the tax treatment of your notes.

United States Alien Holders

This section applies to you only if you are a United States alien holder. You are a United States alien holder if you are the beneficial owner of the notes and are, for U.S. federal income tax purposes:

- a nonresident alien individual;
- a foreign corporation; or
- an estate or trust that in either case is not subject to U.S. federal income tax on a net income basis on income or gain from the notes.

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Because the U.S. federal income tax treatment (including the applicability of withholding) of the coupon payments on the notes is uncertain, in the absence of further guidance, we intend to withhold on the coupon payments made to you at a 30% rate or at a lower rate specified by an applicable income tax treaty under an “other income” or similar provision. We will not make payments of any additional amounts. To claim a reduced treaty rate for withholding, you generally must provide a valid Internal Revenue Service Form W-8BEN, Internal Revenue Service Form W-8BEN-E, or an acceptable substitute form upon which you certify, under penalty of perjury, your status as a U.S. alien holder and your entitlement to the lower treaty rate. Payments will be made to you at a reduced treaty rate of withholding only if such reduced treaty rate would apply to any possible characterization of the payments (including, for example, if the coupon payments were characterized as contract fees). Withholding also may not apply to coupon payments made to you if: (i) the coupon payments are “effectively connected” with your conduct of a trade or business in the United States and are includable in your gross income for U.S. federal income tax purposes, (ii) the coupon payments are attributable to a permanent establishment that you maintain in the United States, if required by an applicable tax treaty, and (iii) you comply with the requisite certification requirements (generally, by providing an Internal Revenue Service Form W-8ECI). If you are eligible for a reduced rate of United States withholding tax, you may obtain a refund of any amounts withheld in excess of that rate by filing a refund claim with the Internal Revenue Service.

“Effectively connected” payments includable in your United States gross income are generally taxed at rates applicable to United States citizens, resident aliens, and domestic corporations; if you are a corporate United States alien holder, “effectively connected” payments may be subject to an additional “branch profits tax” under certain circumstances.

You will also be subject to generally applicable information reporting and backup withholding requirements with respect to payments on your notes and, notwithstanding that we do not intend to treat the notes as debt for tax purposes, we intend to backup withhold on such payments with respect to your notes unless you comply with the requirements necessary to avoid backup withholding on debt instruments (in which case you will not be subject to such backup withholding) as set forth under “United States Taxation – Taxation of Debt Securities – United States Alien Holders” in the accompanying prospectus.

Furthermore, on December 7, 2007, the Internal Revenue Service released Notice 2008-2 soliciting comments from the public on various issues, including whether instruments such as your notes should be subject to withholding. It is therefore possible that rules will be issued in the future, possibly with retroactive effects, that would cause payments on your notes to be subject to withholding, even if you comply with certification requirements as to your foreign status.

As discussed above, alternative characterizations of the notes for U.S. federal income tax purposes are possible. Should an alternative characterization of the notes, by reason of a change or clarification of the law, by regulation or otherwise, cause payments with respect to the notes to become subject to withholding tax, we will withhold tax at the applicable statutory rate and we will not make payments of any additional amounts. Prospective United States alien holders of the notes should consult their tax advisors in this regard.

In addition, the Treasury Department has issued regulations under which amounts paid or deemed paid on certain financial instruments (“871(m) financial instruments”) that are treated as attributable to U.S.-source dividends could be treated, in whole or in part depending on the circumstances, as a “dividend equivalent” payment that is subject to tax at a rate of 30% (or a lower rate under an applicable treaty), which in the case of any coupon payments and any amounts you receive upon the sale, exchange, redemption or maturity of your notes, could be collected via withholding. If these regulations were to apply to the notes, we may be required to withhold such taxes if any U.S.-source dividends are paid on the stocks included in the indices during the term of the notes. We could also require you to make certifications (e.g., an applicable Internal Revenue Service Form W-8) prior to any coupon payment or the maturity of the notes in order to avoid or minimize withholding obligations, and we could withhold accordingly (subject to your potential right to claim a refund from the Internal Revenue Service) if such certifications were not received or were not satisfactory. If withholding was required, we would not be required to pay any additional amounts with respect to amounts so withheld. These regulations generally will apply to 871(m) financial instruments (or a combination of financial instruments treated as having been entered into in connection with each other)

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issued (or significantly modified and treated as retired and reissued) on or after January 1, 2021, but will also apply to certain 871(m) financial instruments (or a combination of financial instruments treated as having been entered into in connection with each other) that have a delta (as defined in the applicable Treasury regulations) of one and are issued (or significantly modified and treated as retired and reissued) on or after January 1, 2017. In addition, these regulations will not apply to financial instruments that reference a "qualified index" (as defined in the regulations). We have determined that, as of the issue date of your notes, your notes will not be subject to withholding under these rules. In certain limited circumstances, however, you should be aware that it is possible for United States alien holders to be liable for tax under these rules with respect to a combination of transactions treated as having been entered into in connection with each other even when no withholding is required. You should consult your tax advisor concerning these regulations, subsequent official guidance and regarding any other possible alternative characterizations of your notes for U.S. federal income tax purposes.

Foreign Account Tax Compliance Act (FATCA) Withholding

Pursuant to Treasury regulations, Foreign Account Tax Compliance Act (FATCA) withholding (as described in "United States Taxation—Taxation of Debt Securities—Foreign Account Tax Compliance Act (FATCA) Withholding" in the accompanying prospectus) will generally apply to obligations that are issued on or after July 1, 2014; therefore, the notes will generally be subject to FATCA withholding. However, according to published guidance, the withholding tax described above will not apply to payments of gross proceeds from the sale, exchange, redemption or other disposition of the notes made before January 1, 2019.

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EMPLOYEE RETIREMENT INCOME SECURITY ACT

This section is only relevant to you if you are an insurance company or the fiduciary of a pension plan or an employee benefit plan (including a governmental plan, an IRA or a Keogh Plan) proposing to invest in the notes.

The U.S. Employee Retirement Income Security Act of 1974, as amended ("ERISA") and the U.S. Internal Revenue Code of 1986, as amended (the "Code"), prohibit certain transactions ("prohibited transactions") involving the assets of an employee benefit plan that is subject to the fiduciary responsibility provisions of ERISA or Section 4975 of the Code (including individual retirement accounts, Keogh plans and other plans described in Section 4975(e)(1) of the Code) (a "Plan") and certain persons who are "parties in interest" (within the meaning of ERISA) or "disqualified persons" (within the meaning of the Code) with respect to the Plan; governmental plans may be subject to similar prohibitions unless an exemption applies to the transaction. The assets of a Plan may include assets held in the general account of an insurance company that are deemed "plan assets" under ERISA or assets of certain investment vehicles in which the Plan invests. Each of The Goldman Sachs Group, Inc. and certain of its affiliates may be considered a "party in interest" or a "disqualified person" with respect to many Plans, and, accordingly, prohibited transactions may arise if the notes are acquired by or on behalf of a Plan unless those notes are acquired and held pursuant to an available exemption. In general, available exemptions are: transactions effected on behalf of that Plan by a "qualified professional asset manager" (prohibited transaction exemption 84-14) or an "in-house asset manager" (prohibited transaction exemption 96-23), transactions involving insurance company general accounts (prohibited transaction exemption 95-60), transactions involving insurance company pooled separate accounts (prohibited transaction exemption 90 1), transactions involving bank collective investment funds (prohibited transaction exemption 91-38) and transactions with service providers under Section 408(b)(17) of ERISA and Section 4975(d)(20) of the Code where the Plan receives no less and pays no more than "adequate consideration" (within the meaning of Section 408(b)(17) of ERISA and Section 4975(f)(10) of the Code). The person making the decision on behalf of a Plan or a governmental plan shall be deemed, on behalf of itself and the plan, by purchasing and holding the notes, or exercising any rights related thereto, to represent that (a) the plan will receive no less and pay no more than "adequate consideration" (within the meaning of Section 408(b)(17) of ERISA and Section 4975(f)(10) of the Code) in connection with the purchase and holding of the notes, (b) none of the purchase, holding or disposition of the notes or the exercise of any rights related to the notes will result in a nonexempt prohibited transaction under ERISA or the Code (or, with respect to a governmental plan, under any similar applicable law or regulation), and (c) neither The Goldman Sachs Group, Inc. nor any of its affiliates is a "fiduciary" (within the meaning of Section 3(21) of ERISA) or, with respect to a governmental plan, under any similar applicable law or regulation) with respect to the purchaser or holder in connection with such person's acquisition, disposition or holding of the notes, or as a result of any exercise by The Goldman Sachs Group, Inc. or any of its affiliates of any rights in connection with the notes, and neither The Goldman Sachs Group, Inc. nor any of its affiliates has provided investment advice in connection with such person's acquisition, disposition or holding of the notes.

If you are an insurance company or the fiduciary of a pension plan or an employee benefit plan (including a governmental plan, an IRA or a Keogh plan), and propose to invest in the notes, you should consult your legal counsel.

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SUPPLEMENTAL PLAN OF DISTRIBUTION

GS Finance Corp. has agreed to sell to GS&Co., and GS&Co. has agreed to purchase from GS Finance Corp., the aggregate face amount of the offered notes specified on the front cover of this prospectus supplement. GS&Co. proposes initially to offer the notes to the public at the original issue price set forth on the cover page of this prospectus supplement, and to certain securities dealers at such price less a concession not in excess of 4% of the face amount.

In the future, GS&Co. or other affiliates of GS Finance Corp. may repurchase and resell the offered notes in market-making transactions, with resales being made at prices related to prevailing market prices at the time of resale or at negotiated prices. GS Finance Corp. estimates that its share of the total offering expenses, excluding underwriting discounts and commissions, will be approximately $15,000. For more information about the plan of distribution and possible market-making activities, see "Plan of Distribution" in the accompanying prospectus.

We will deliver the notes against payment therefor in New York, New York on September 28, 2018.

We have been advised by GS&Co. that it intends to make a market in the notes. However, neither GS&Co. nor any of our other affiliates that makes a market is obligated to do so and any of them may stop doing so at any time without notice. No assurance can be given as to the liquidity or trading market for the notes.

Any notes which are the subject of the offering contemplated by this prospectus supplement, the accompanying prospectus and the accompanying prospectus supplement may not be offered, sold or otherwise made available to any retail investor in the European Economic Area. Consequently no key information document required by Regulation (EU) No 1286/2014 (the "PRIIPs Regulation") for offering or selling the notes or otherwise making them available to retail investors in the EEA has been prepared and therefore offering or selling the notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation. For the purposes of this provision:

a) the expression "retail investor" means a person who is one (or more) of the following:

(i) a retail client as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, "MiFID II"); or

(ii) a customer within the meaning of Directive 2002/92/EC (as amended, the "Insurance Mediation Directive"), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or

(iii) not a qualified investor as defined in Directive 2003/71/EC (as amended, the "Prospectus Directive"); and

b) the expression an "offer" includes the communication in any form and by any means of sufficient information on the terms of the offer and the notes to be offered so as to enable an investor to decide to purchase or subscribe for the notes.

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), GS&Co. has represented and agreed that with effect from and including the date on which the Prospectus Directive is implemented in that Relevant Member State (the "Relevant Implementation Date") it has not made and will not make an offer of notes which are the subject of the offering contemplated by this prospectus supplement, the accompanying prospectus and the accompanying prospectus supplement to the public in that Relevant Member State except that, with effect from and including the Relevant Implementation Date, an offer of such notes may be made to the public in that Relevant Member State:

a) at any time to any legal entity which is a qualified investor as defined in the Prospectus Directive;

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b) at any time to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), subject to obtaining the prior consent of the relevant dealer or dealers nominated by the issuer for any such offer; or

c) at any time in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of notes referred to above shall require us or any dealer to publish a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer of notes to the public" in relation to any notes in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the notes to be offered so as to enable an investor to decide to purchase or subscribe for the notes, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (as amended, including by Directive 2010/73/EU), and includes any relevant implementing measure in the Relevant Member State.

Any invitation or inducement to engage in investment activity (within the meaning of Section 21 of the FSMA) in connection with the issue or sale of the notes may only be communicated or caused to be communicated in circumstances in which Section 21(1) of the FSMA does not apply to GS Finance Corp. or The Goldman Sachs Group, Inc.

All applicable provisions of the FSMA must be complied with in respect to anything done by any person in relation to the notes in, from or otherwise involving the United Kingdom.

The notes may not be offered or sold in Hong Kong by means of any document other than (i) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) and any rules made thereunder, or (ii) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong) or which do not constitute an offer to the public within the meaning of that Ordinance; and no advertisement, invitation or document relating to the notes may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere) which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to the notes which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the Securities and Futures Ordinance and any rules made thereunder.

This prospectus supplement, along with the accompanying prospectus supplement and the accompanying prospectus have not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus supplement, along with the accompanying prospectus supplement and the accompanying prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the notes may not be circulated or distributed, nor may the notes be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor (as defined in Section 4A of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA")) under Section 274 of the SFA, (ii) to a relevant person (as defined in Section 275(2) of the SFA) pursuant to Section 275(1) of the SFA, or any person pursuant to Section 275(1A) of the SFA, and in accordance with the conditions specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA, in each case subject to conditions set forth in the SFA.

Where the notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor, the securities (as defined in Section 239(1) of the SFA) of that corporation shall not be transferable for six months after that corporation has acquired the notes under Section 275 of the SFA except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (2) where such transfer arises from an offer in that corporation's securities pursuant to Section 275(1A) of the SFA, (3) where no consideration is or will be given for the transfer, (4) where the transfer is by operation of law, (5) as specified in Section 276(7) of the

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SFA, or (6) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore ("Regulation 32").

Where the notes are subscribed or purchased under Section 275 of the SFA by a relevant person which is a trust (where the trustee is not an accredited investor (as defined in Section 4A of the SFA)) whose sole purpose is to hold investments and each beneficiary of the trust is an accredited investor, the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferable for six months after that trust has acquired the notes under Section 275 of the SFA except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person (as defined in Section 275(2) of the SFA), (2) where such transfer arises from an offer that is made on terms that such rights or interest are acquired at a consideration of not less than S$200,000 (or its equivalent in a foreign currency) for each transaction (whether such amount is to be paid for in cash or by exchange of securities or other assets), (3) where no consideration is or will be given for the transfer, (4) where the transfer is by operation of law, (5) as specified in Section 276(7) of the SFA, or (6) as specified in Regulation 32.

The notes have not been and will not be registered under the Financial Instruments and Exchange Act of Japan (Act No. 25 of 1948, as amended), or the FIEA. The notes may not be offered or sold, directly or indirectly, in Japan or to or for the benefit of any resident of Japan (including any person resident in Japan or any corporation or other entity organized under the laws of Japan) or to others for reoffering or resale, directly or indirectly, in Japan or to or for the benefit of any resident of Japan, except pursuant to an exemption from the registration requirements of the FIEA and otherwise in compliance with any relevant laws and regulations of Japan.

The notes are not offered, sold or advertised, directly or indirectly, in, into or from Switzerland on the basis of a public offering and will not be listed on the SIX Swiss Exchange or any other offering or regulated trading facility in Switzerland. Accordingly, neither this prospectus supplement nor any accompanying prospectus supplement, prospectus or other marketing material constitute a prospectus as defined in article 652a or article 1156 of the Swiss Code of Obligations or a listing prospectus as defined in article 32 of the Listing Rules of the SIX Swiss Exchange or any other regulated trading facility in Switzerland. Any resales of the notes by the underwriters thereof may only be undertaken on a private basis to selected individual investors in compliance with Swiss law. This prospectus supplement and accompanying prospectus and prospectus supplement may not be copied, reproduced, distributed or passed on to others or otherwise made available in Switzerland without our prior written consent. By accepting this prospectus supplement and accompanying prospectus and prospectus supplement or by subscribing to the notes, investors are deemed to have acknowledged and agreed to abide by these restrictions. Investors are advised to consult with their financial, legal or tax advisers before investing in the notes.

Conflicts of Interest

GS&Co. is an affiliate of GS Finance Corp. and The Goldman Sachs Group, Inc. and, as such, will have a "conflict of interest" in this offering of notes within the meaning of Financial Industry Regulatory Authority, Inc. (FINRA) Rule 5121. Consequently, this offering of notes will be conducted in compliance with the provisions of FINRA Rule 5121. GS&Co. will not be permitted to sell notes in this offering to an account over which it exercises discretionary authority without the prior specific written approval of the account holder.

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VALIDITY OF THE NOTES AND GUARANTEE

In the opinion of Sidley Austin LLP, as counsel to GS Finance Corp. and The Goldman Sachs Group, Inc., when the notes offered by this prospectus supplement have been executed and issued by GS Finance Corp., the related guarantee offered by this prospectus supplement has been executed and issued by The Goldman Sachs Group, Inc., and such notes have been authenticated by the trustee pursuant to the indenture, and such notes and the guarantee have been delivered against payment as contemplated herein, (a) such notes will be valid and binding obligations of GS Finance Corp., enforceable in accordance with their terms, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith), provided that such counsel expresses no opinion as to the effect of fraudulent conveyance, fraudulent transfer or similar provision of applicable law on the conclusions expressed above and (b) such related guarantee will be a valid and binding obligation of The Goldman Sachs Group, Inc., enforceable in accordance with its terms, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith), provided that such counsel expresses no opinion as to the effect of fraudulent conveyance, fraudulent transfer or similar provision of applicable law on the conclusions expressed above. This opinion is given as of the date hereof and is limited to the laws of the State of New York and the General Corporation Law of the State of Delaware as in effect on the date hereof. In addition, this opinion is subject to customary assumptions about the trustee’s authorization, execution and delivery of the indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated July 10, 2017, which has been filed as Exhibit 5.6 to the registration statement on Form S-3 filed with the Securities and Exchange Commission by GS Finance Corp. and The Goldman Sachs Group, Inc. on July 10, 2017.

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We have not authorized anyone to provide any information or to make any representations other than those contained or incorporated by reference in this prospectus supplement, the accompanying prospectus supplement or the accompanying prospectus. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus supplement, the accompanying prospectus supplement and the accompanying prospectus is an offer to sell only the notes offered hereby, but only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus supplement, the accompanying prospectus supplement and the accompanying prospectus is current only as of the respective dates of such documents.

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$233,000

GS Finance Corp.

Callable Contingent Coupon Index-Linked Notes due 2028

guaranteed by
The Goldman Sachs Group, Inc.

Goldman Sachs & Co. LLC

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$
1,544

Other current assets (includes capitalized contract acquisition costs)

$
2,940

$
371

(3), (4)

$
—

$
(25
)
(3)
$
3,286

Deferred tax assets

$
3,219

$
(624
)
(3)
$
(15
)
(3)
$
1,415

(8)
$
3,995

Other assets (includes capitalized contract acquisition costs)

$
1,582

$
327

(4)
$
136

(7)
$
(91
)
(3)
$
1,954

TOTAL ASSETS

$
108,784

$
(332
)

$
121

$
1,299

$
109,872

LIABILITIES AND EQUITY

Income taxes payable

$
1,004

$
—

$
—

$
11

(3)

$
1,015

Deferred revenue — current

$
11,490

$
(1,702
)

(5)

$
—

$
—

$
9,788

Other current liabilities

$
4,413

$
33

(6)
$
—

$
—

$
4,446

Deferred revenue — non-current

$
8,195

$
(1,081
)
(5)
$
—

$
—

$
7,114

Other long-term liabilities

$
1,434

$
85

(3)
$
13

(3)
$
—

$
1,532

Retained earnings

$
1,233

$
2,333

(10)

$
283

(10)

$
1,281

(10)

$
5,130

Accumulated other comprehensive income (loss)

$
(849
)

$
—

$
(175
)
(9)

$
7

(3)

$
(1,017
)

TOTAL LIABILITIES AND EQUITY

$
108,784

$
(332
)

$
121

$
1,299

$
109,872

(1) Primarily represents the decrease to accounts receivable related to the change in recognizing revenue on sales to two-tier distributors from a sell-through to a sell-in basis
(2) Primarily represents the reduction of inventory for the change from recognizing revenue on sales to two-tier distributors from a sell-through to a sell-in basis
(3) Includes the impacts to deferred tax assets, liabilities and other income tax balances
(4) Primarily represents capitalized contract acquisition costs (e.g. commissions)
(5) Primarily represents deferred revenue adjusted to retained earnings primarily due to the change in revenue recognition for certain software arrangements from ratable to upfront, recognizing revenue on sales to two-tier distributors from a sell-through to a sell-in basis. Of this total $2.8 billion adjustment, $2.6 billion related to product deferred revenue, of which $1.3 billion relates to our recurring software and subscription offers, $0.6 billion relates to two-tier distribution, and the remainder relates to non-recurring software and other adjustments.
(6) Primarily represents the reclassification of accounts receivable contra balances to other current liabilities, adjustments to rebate liabilities for the change from recognizing revenue on sales to two-tier distributors from a sell-through to a sell-in basis, and reclassifications from other current liabilities for amounts that are not contract liabilities under ASC 606
(7) Represents the adjustment due to the remeasurement of non-marketable equity investments at fair value
(8) Primarily represents the change in net deferred tax assets related to unrecognized income tax effects of intra-entity asset transfers
(9) Represents the reclassification of net unrealized gains from accumulated other comprehensive income (loss) to retained earnings
(10) Retained earnings impact from the adjustments noted above

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(Unaudited)

Impact of ASC 606 Adoption

The application of ASC 606 increased our total revenue by $267 million and $516 million in the second quarter and first six months of fiscal 2019, respectively. The application of ASC 606 did not have a material impact to either our cost of sales or our operating expenses in the second quarter and first six months of fiscal 2019. We recognized a $152 million benefit to our provision for income taxes relating to indirect effects from the adoption of ASC 606 in the first quarter of fiscal 2019. For additional information regarding ASC 606, see Note 3 to the Consolidated Financial Statements.

In connection with the adoption of ASC 606, we recorded a transition adjustment to increase retained earnings by $2.3 billion. See above for the transition impact of ASC 606 by balance sheet line item. As of January 26, 2019, the balance sheet changes attributable to ASC 606 related to accounts receivable, inventories, and deferred revenue were not materially different than the impacts upon adoption. In connection with the adoption of ASC 606, we established contract assets for unbilled receivables. As of January 26, 2019, we had total contract assets of $557 million, of which $241 million was recorded in other current assets and $316 million was recorded in other assets. As of January 26, 2019, we had total capitalized contract acquisition costs of $686 million, of which $380 million was recorded in other current assets and $306 million was recorded in other assets. The adoption of ASC 606 did not have any impact on net cash provided by operating activities.

(b) Recent Accounting Standards or Updates Not Yet Effective

Leases In February 2016, the FASB issued an accounting standard update and subsequent amendments related to leases requiring lessees to recognize operating and financing lease liabilities on the balance sheet, as well as corresponding right-of-use assets. The new lease standard also makes some changes to lessor accounting and aligns key aspects of the lessor accounting model with the revenue recognition standard. In addition, disclosures will be required to enable users of financial statements to assess the amount, timing, and uncertainty of cash flows arising from leases. The accounting standard update will be effective for us beginning in the first quarter of fiscal 2020 and early adoption is permitted. We expect to adopt this accounting standard update on a modified retrospective basis in the first quarter of fiscal 2020, and we are currently evaluating the impact of this accounting standard update on our Consolidated Financial Statements.

Credit Losses of Financial Instruments In June 2016, the FASB issued an accounting standard update that requires measurement and recognition of expected credit losses for financial assets held based on historical experience, current conditions, and reasonable and supportable forecasts that affect the collectibility of the reported amount. The accounting standard update will be effective for us beginning in the first quarter of fiscal 2021 and early adoption in fiscal 2020 is permitted. We expect to adopt this accounting standard update on a modified retrospective basis in the first quarter of fiscal 2021, and we are currently evaluating the impact of this accounting standard update on our Consolidated Financial Statements.

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(Unaudited)

3. Revenue

(a) Disaggregation of Revenue

We disaggregate our revenue into groups of similar products and services that depict the nature, amount, and timing of revenue and cash flows for our various offerings. The sales cycle, contractual obligations, customer requirements, and go-to-market strategies differ for each of our product categories, resulting in different economic risk profiles for each category. The following table presents this disaggregation of revenue (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Revenue:				
Infrastructure Platforms	$7,128	$ 6,710	$14,770	$ 13,690
Applications	1,465	1,184	2,884	2,387
Security	658	557	1,308	1,142
Other Products	22	258	200	544
Total Product	9,273	8,709	19,163	17,763
Services	3,173	3,178	6,355	6,260
Total [1]	$12,446	$ 11,887	$25,518	$ 24,023

Amounts may not sum due to rounding.

[1] During the second quarter of fiscal 2019, we completed the divestiture of the Service Provider Video Software Solutions ("SPVSS") business. Total revenue includes SPVSS business revenue of $0 and $230 million for the second quarter of fiscal 2019 and 2018, respectively, and $168 million and $478 million for the first six months of fiscal 2019 and 2018, respectively.

Infrastructure Platforms consist of our core networking technologies of switching, routing, data center products, and wireless that are designed to work together to deliver networking capabilities and transport and/or store data. These technologies consist of both hardware and software offerings, including software licenses and software-as-a-service (SaaS), that help our customers build networks, automate, orchestrate, integrate, and digitize data. We are shifting and expanding more of our business to software and subscriptions across our core networking portfolio. Our hardware and perpetual software in this category are distinct performance obligations where revenue is recognized upfront upon transfer of control. Term software licenses are multiple performance obligations where the term license is recognized upfront upon transfer of control with the associated software maintenance revenue recognized ratably over the contract term. SaaS arrangements in this category have one distinct performance obligation which is satisfied over time with revenue recognized ratably over the contract term.

Applications consists of offerings that utilize the core networking and data center platforms to provide their functions. The products consist primarily of software offerings, including software licenses and SaaS, as well as hardware. Our perpetual software and hardware in this category are distinct performance obligations where revenue is recognized upfront upon transfer of control. Term software licenses are multiple performance obligations where the term license is recognized upfront upon transfer of control with the associated software maintenance revenue recognized ratably over the contract term. SaaS arrangements in this category have one distinct performance obligation which is satisfied over time with revenue recognized ratably over the contract term.

Security primarily includes our unified threat management, advanced threat security, and web security products. These products consist of both hardware and software offerings, including software licenses and SaaS. Updates and upgrades for the term software licenses are critical for our software to perform its intended commercial purpose because of the continuous need for our software to secure our customers' network environments against frequent threats. Therefore, security software licenses are generally represented by a single distinct performance obligation with revenue recognized ratably over the contract term. Our hardware and perpetual software in this category are distinct performance obligations where revenue is recognized upfront upon transfer of control. SaaS arrangements in this category have one distinct performance obligation which is satisfied over time with revenue recognized ratably over the contract term.

Other Products primarily include our Service Provider Video Software Solutions and cloud and system management products. On May 1, 2018, we announced a definitive agreement to sell the SPVSS business. The sale closed on October 28, 2018. These products include both hardware and software licenses. Our offerings in this category are distinct performance obligations where revenue is recognized upfront upon transfer of control.

In addition to our product offerings, we provide a broad range of service and support options for our customers, including technical support services and advanced services. Technical support services represent the majority of these offerings which are distinct performance obligations that are satisfied over time with revenue recognized ratably over the contract term. Advanced services are distinct performance obligations that are satisfied over time with revenue recognized as services are delivered.

The sales arrangements as discussed above are typically made pursuant to customer purchase orders based on master purchase or partner agreements. Cash is received based on our standard payment terms which is typically 30 days. We provide financing arrangements to customers for all of our hardware, software and service offerings. Refer to Note 8 for additional information. For these arrangements, cash is typically received over time.

(b) Contract Balances

Accounts receivable, net was $3.7 billion as of January 26, 2019 compared to $5.6 billion as of July 28, 2018, as reported on the Consolidated Balance Sheet.

Contract assets consist of unbilled receivables and are recorded when revenue is recognized in advance of scheduled billings to our customers. These amounts are primarily related to software and service arrangements where transfer of control has occurred but we have not yet invoiced. As of January 26, 2019 and July 29, 2018, our contract assets for these unbilled receivables were $557 million and $122 million, respectively, and were included in other current assets and other assets.

Contract liabilities consist of deferred revenue. Deferred revenue was $17.3 billion as of January 26, 2019 compared to $19.7 billion as of July 28, 2018. In connection with the adoption of ASC 606, we recorded an adjustment to retained earnings to reduce deferred revenue by $2.8 billion. We recognized approximately $2.6 billion and $6.0 billion of revenue during the second quarter and first six months of fiscal 2019, respectively, that was included in the deferred revenue balance at July 29, 2018.

(c) Remaining Performance Obligations

Remaining Performance Obligations (RPO) are comprised of deferred revenue plus unbilled contract revenue. As of January 26, 2019, the aggregate amount of RPO was $22.5 billion, comprised of $17.3 billion of deferred revenue and $5.2 billion of unbilled contract revenue. We expect approximately 56% of this amount to be recognized as revenue over the next year. Unbilled contract revenue represents non-cancelable contracts for which we have not invoiced, have an obligation to perform, and revenue has not yet been recognized in the financial statements.

(d) Capitalized Contract Acquisition Costs

In connection with the adoption of ASC 606, we began to capitalize direct and incremental costs incurred to acquire contracts, primarily sales commissions, for which the associated revenue is expected to be recognized in future periods. We incur these costs in connection with both initial contracts and renewals. These costs are initially deferred and typically amortized over the term of the customer contract which corresponds to the period of benefit. Deferred sales commissions were $686 million and $644 million as of January 26, 2019 and July 29, 2018, respectively, and were included in other current assets and other assets. The amortization expense associated with these costs was $100 million and $212 million for the second quarter and first six months of fiscal 2019, respectively, and was included in sales and marketing expenses.

4. Acquisitions and Divestitures

We completed three acquisitions during the first six months of fiscal 2019. A summary of the allocation of the total purchase consideration is presented as follows (in millions):

	Purchase Consideration	Net Tangible Assets Acquired (Liabilities	Purchased Intangible Assets	Goodwill

		Assumed)		
Duo	$ 2,025	$ (57)	$ 342	$ 1,740
Others (two in total)	60	3	8	49
Total	$ 2,085	$ (54)	$ 350	$ 1,789

On September 28, 2018, we completed our acquisition of privately held Duo Security, Inc. ("Duo"), a leading provider of unified access security and multi-factor authentication delivered through the cloud. Revenue from the Duo acquisition has been included in our Security product category.

The total purchase consideration related to acquisitions completed during the first six months of fiscal 2019 consisted of cash consideration. The total cash and cash equivalents acquired from these acquisitions was approximately $85 million. Total transaction costs related to acquisition and divestiture activities were $11 million and $14 million for the first six months of fiscal 2019 and

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fiscal 2018, respectively. These transaction costs were expensed as incurred in general and administrative expenses ("G&A") in the Consolidated Statements of Operations.

The goodwill generated from acquisitions completed during the first six months of fiscal 2019 is primarily related to expected synergies. The goodwill is generally not deductible for income tax purposes.

The Consolidated Financial Statements include the operating results of each acquisition from the date of acquisition. Pro forma results of operations and the revenue and net income subsequent to the acquisition date for the acquisitions completed during the first six months of fiscal 2019 have not been presented because the effects of the acquisitions, individually and in the aggregate, were not material to our financial results.

Divestiture of Service Provider Video Software Solutions   On October 28, 2018, we completed the sale of the Service Provider Video Software Solutions business. This business had tangible assets of approximately $160 million (primarily comprised of accounts receivables, inventories and various other current and long-term assets) and net intangible assets and goodwill (based on relative fair value) of $340 million. In addition, the business had total liabilities of approximately $200 million (primarily comprised of deferred revenue and various other current and long-term liabilities). We recognized an immaterial gain from this transaction in the second quarter of fiscal 2019.

We completed two divestitures during the second quarter of fiscal 2018. The financial statement impact of these divestitures was not material for the second quarter and first six months of fiscal 2018.

Acquisition of Luxtera   On February 6, 2019, we completed our acquisition of Luxtera, Inc. ("Luxtera"), a semiconductor company, for total consideration of approximately $660 million in cash and assumed equity awards. Revenue from the Luxtera acquisition will be included in our Infrastructure Platforms product category. We expect that most of the purchase price will be allocated to goodwill and purchased intangible assets.

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CISCO SYSTEMS, INC.
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5. Goodwill and Purchased Intangible Assets

(a) Goodwill

The following table presents the goodwill allocated to our reportable segments as of January 26, 2019 and during the first six months of fiscal 2019 (in millions):

	Balance at July 28, 2018	Acquisitions & Divestitures	Other	Balance at January 26, 2019
Americas	$19,998	$ 1,082	$(79)	$ 21,001
EMEA	7,529	429	(22)	7,936
APJC	4,179	190	(13)	4,356
Total	$31,706	$ 1,701	$(114)	$ 33,293

“Other” in the table above primarily consists of foreign currency translation as well as immaterial purchase accounting adjustments.

(b) Purchased Intangible Assets

The following table presents details of our intangible assets acquired through acquisitions completed during the first six months of fiscal 2019 (in millions, except years):

	FINITE LIVES						INDEFINITE LIVES	TOTAL
	TECHNOLOGY		CUSTOMER RELATIONSHIPS		OTHER		IPR&D	
	Weighted-Average Useful Life (in Years)	Amount	Weighted-Average Useful Life (in Years)	Amount	Weighted-Average Useful Life (in Years)	Amount	Amount	Amount
Duo	5.0	$ 153	5.0	$ 94	2.5	$ 18	$ 77	$ 342
Others (two in total)	5.0	8	—	—	—	—	—	8
Total		$ 161		$ 94		$ 18	$ 77	$ 350

The following tables present details of our purchased intangible assets (in millions):

January 26, 2019	Gross	Accumulated Amortization	Net
Purchased intangible assets with finite lives:			
Technology	$3,165	$ (1,620)	$1,545
Customer relationships	812	(292)	520
Other	55	(30)	25
Total purchased intangible assets with finite lives	4,032	(1,942)	2,090
In-process research and development, with indefinite lives	180	—	180
Total	$4,212	$ (1,942)	$2,270

July 28, 2018	Gross	Accumulated Amortization	Net
Purchased intangible assets with finite lives:			
Technology	$3,711	$ (1,888)	$1,823
Customer relationships	1,538	(937)	601

Other	63	(38)	25
Total purchased intangible assets with finite lives	5,312	(2,863)	2,449
In-process research and development, with indefinite lives	103	—	103
Total	$5,415	$ (2,863)	$2,552

Purchased intangible assets include intangible assets acquired through acquisitions as well as through direct purchases or licenses.

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CISCO SYSTEMS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)
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There were no impairment charges related to purchased intangible assets for the second quarter and first six months of fiscal 2019 and for the corresponding periods of fiscal 2018. Impairment charges are primarily a result of declines in estimated fair values of certain purchased intangible assets resulting from the reduction or elimination of expected future cash flows associated with certain of our technology and in-process research and development (IPR&D) intangible assets.
The following table presents the amortization of purchased intangible assets, including impairment charges (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Amortization of purchased intangible assets:				
Cost of sales	$156	$ 160	$307	$ 314
Operating expenses	39	60	73	121
Total	$195	$ 220	$380	$ 435

The estimated future amortization expense of purchased intangible assets with finite lives as of January 26, 2019 is as follows (in millions):

Fiscal Year	Amount
2019 (remaining six months)	$ 382
2020	$ 726
2021	$ 530
2022	$ 274
2023	$ 133
Thereafter	$ 45

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CISCO SYSTEMS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)
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6. Restructuring and Other Charges

We initiated a restructuring plan during fiscal 2018 (the "Fiscal 2018 Plan") in order to realign the organization and enable further investment in key priority areas with estimated pretax charges of approximately $600 million. These aggregate pretax charges are primarily cash-based and consist of employee severance and other one-time termination benefits, and other associated costs. In connection with the Fiscal 2018 Plan, we have incurred charges of $186 million and $264 million for the second quarter and first six months of fiscal 2019, respectively, and have incurred cumulative charges of $372 million. We expect the Fiscal 2018 Plan to be substantially completed in fiscal 2019.

We announced a restructuring plan in August 2016 (the "Fiscal 2017 Plan"), in order to reinvest in our key priority areas. In connection with the Fiscal 2017 Plan, we incurred cumulative charges of approximately $1.0 billion, which were primarily cash-based and consisted of employee severance and other one-time termination benefits, and other associated costs. We completed the Fiscal 2017 Plan in fiscal 2018.

The following tables summarize the activities related to the restructuring and other charges (in millions):

	FISCAL 2017 AND PRIOR PLANS		FISCAL 2018 PLAN		
	Employee Severance	Other	Employee Severance	Other	Total
Liability as of July 28, 2018	$41	$13	$19	$ —	$73
Charges	—	(1)	222	43	264
Cash payments	(31)	(3)	(202)	(1)	(237)
Non-cash items	—	—	—	(42)	(42)
Liability as of January 26, 2019	$10	$9	$39	$ —	$58

	FISCAL 2017 AND PRIOR PLANS		
	Employee Severance	Other	Total
Liability as of July 29, 2017	$74	$43	$117
Charges	223	27	250
Cash payments	(213)	(27)	(240)
Non-cash items	3	(18)	(15)
Liability as of January 27, 2018	$87	$25	$112

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CISCO SYSTEMS, INC.
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7. Balance Sheet Details
The following tables provide details of selected balance sheet items (in millions):

	January 26, 2019	July 28, 2018
Cash and cash equivalents	$ 9,835	$ 8,934
Restricted cash included in other current assets	23	32
Restricted cash included in other assets	21	27
Total cash, cash equivalents, and restricted cash	$ 9,879	$ 8,993

Inventories:		
Raw materials	$468	$423
Finished goods:		
Deferred cost of sales and distributor inventory	74	443
Manufactured finished goods	908	689
Total finished goods	982	1,132
Service-related spares	228	258
Demonstration systems	23	33
Total	$1,701	$1,846

Property and equipment, net:		
Gross property and equipment:		
Land, buildings, and building and leasehold improvements	$4,731	$4,710
Computer equipment and related software	965	1,085
Production, engineering, and other equipment	5,616	5,734
Operating lease assets	529	356
Furniture and fixtures	369	358
Total gross property and equipment	12,210	12,243
Less: accumulated depreciation and amortization	(9,279)	(9,237)
Total	$2,931	$3,006

Deferred revenue:		
Service	$11,246	$11,431
Product	6,015	8,254
Total	$17,261	$19,685
Reported as:		
Current	$9,976	$11,490
Noncurrent	7,285	8,195
Total	$17,261	$19,685

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CISCO SYSTEMS, INC.
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8. Financing Receivables and Operating Leases
(a) Financing Receivables
Financing receivables primarily consist of lease receivables, loan receivables, and financed service contracts. Lease receivables represent sales-type and direct-financing leases resulting from the sale of Cisco’s and complementary third-party products and are typically collateralized by a security interest in the underlying assets. Lease receivables consist of arrangements with terms of four years on average. Loan receivables represent financing arrangements related to the sale of our hardware, software, and services, which may include additional funding for other costs associated with network installation and integration of our products and services. Loan receivables generally have terms of up to three years. Financed service contracts include financing receivables related to technical support and advanced services. Revenue related to the technical support services is typically deferred and included in deferred service revenue and is recognized ratably over the period during which the related services are to be performed, which typically ranges from one to three years.
A summary of our financing receivables is presented as follows (in millions):

January 26, 2019	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Gross	$ 2,483	$ 4,926	$ 2,398	$ 9,807
Residual value	153	—	—	153
Unearned income	(138)	—	—	(138)
Allowance for credit loss	(127)	(64)	(9)	(200)
Total, net	$ 2,371	$ 4,862	$ 2,389	$ 9,622
Reported as:				
Current	$ 1,121	$ 2,502	$ 1,434	$ 5,057
Noncurrent	1,250	2,360	955	4,565
Total, net	$ 2,371	$ 4,862	$ 2,389	$ 9,622
July 28, 2018	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Gross	$ 2,688	$ 4,999	$ 2,326	$ 10,013
Residual value	164	—	—	164
Unearned income	(141)	—	—	(141)
Allowance for credit loss	(135)	(60)	(10)	(205)
Total, net	$ 2,576	$ 4,939	$ 2,316	$ 9,831
Reported as:				
Current	$ 1,249	$ 2,376	$ 1,324	$ 4,949
Noncurrent	1,327	2,563	992	4,882
Total, net	$ 2,576	$ 4,939	$ 2,316	$ 9,831

Future minimum lease payments to Cisco on lease receivables as of January 26, 2019 are summarized as follows (in millions):

Fiscal Year	Amount
2019 (remaining six months)	$ 637
2020	855
2021	532
2022	309
2023	126

Thereafter	24
Total	$ 2,483

Actual cash collections may differ from the contractual maturities due to early customer buyouts, refinancings, or defaults.

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(b) Credit Quality of Financing Receivables

Gross receivables, excluding residual value, less unearned income categorized by our internal credit risk rating as of January 26, 2019 and July 28, 2018 are summarized as follows (in millions):

	INTERNAL CREDIT RISK RATING			
January 26, 2019	1 to 4	5 to 6	7 and Higher	Total
Lease receivables	$1,233	$1,066	$ 46	$2,345
Loan receivables	3,000	1,875	51	4,926
Financed service contracts	1,390	995	13	2,398
Total	$5,623	$3,936	$ 110	$9,669

	INTERNAL CREDIT RISK RATING			
July 28, 2018	1 to 4	5 to 6	7 and Higher	Total
Lease receivables	$1,294	$1,199	$ 54	$2,547
Loan receivables	3,184	1,752	63	4,999
Financed service contracts	1,468	835	23	2,326
Total	$5,946	$3,786	$ 140	$9,872

We determine the adequacy of our allowance for credit loss by assessing the risks and losses inherent in our financing receivables by portfolio segment. The portfolio segment is based on the types of financing offered by us to our customers, which consist of the following: lease receivables, loan receivables, and financed service contracts.

Our internal credit risk ratings of 1 through 4 correspond to investment-grade ratings, while credit risk ratings of 5 and 6 correspond to non-investment grade ratings. Credit risk ratings of 7 and higher correspond to substandard ratings.

The following tables present the aging analysis of gross receivables, excluding residual value and less unearned income as of January 26, 2019 and July 28, 2018 (in millions):

	DAYS PAST DUE (INCLUDES BILLED AND UNBILLED)							
January 26, 2019	31-60	61-90	91+	Total Past Due	Current	Total	Nonaccrual Financing Receivables	Impaired Financing Receivables
Lease receivables	$79	$ 34	$152	$ 265	$2,080	$2,345	$ 3	$ 3
Loan receivables	73	39	235	347	4,579	4,926	28	28
Financed service contracts	74	38	280	392	2,006	2,398	2	2
Total	$226	$ 111	$667	$ 1,004	$8,665	$9,669	$ 33	$ 33

	DAYS PAST DUE (INCLUDES BILLED AND UNBILLED)							
July 28, 2018	31-60	61-90	91+	Total Past Due	Current	Total	Nonaccrual Financing Receivables	Impaired Financing Receivables
Lease receivables	$72	$ 27	$155	$ 254	$2,293	$2,547	$ 9	$ 9
Loan receivables	104	55	252	411	4,588	4,999	30	30
Financed service contracts	138	78	304	520	1,806	2,326	3	3
Total	$314	$ 160	$711	$ 1,185	$8,687	$9,872	$ 42	$ 42

Past due financing receivables are those that are 31 days or more past due according to their contractual payment terms. The data in the preceding tables is presented by contract, and the aging classification of each contract is based on the oldest outstanding receivable, and therefore past due amounts also include unbilled and current receivables within the same contract. The balances of either unbilled or current financing receivables included in the category of 91 days plus past due for financing receivables were $396 million and $503 million as of January 26, 2019 and July 28, 2018, respectively.

As of January 26, 2019, we had financing receivables of $247 million, net of unbilled or current receivables, that were in the category of 91 days plus past due but remained on accrual status as they are well secured and in the process of collection. Such balance was $182 million as of July 28, 2018.

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(c) Allowance for Credit Loss Rollforward

The allowances for credit loss and the related financing receivables are summarized as follows (in millions):

Three months ended January 26, 2019	CREDIT LOSS ALLOWANCES			
	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Allowance for credit loss as of October 27, 2018	$131	$ 60	$ 8	$199
Provisions (benefits)	(4)	4	1	1
Allowance for credit loss as of January 26, 2019	$127	$ 64	$ 9	$200

Six months ended January 26, 2019	CREDIT LOSS ALLOWANCES			
	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Allowance for credit loss as of July 28, 2018	$135	$ 60	$ 10	$205
Provisions (benefits)	(7)	4	(1)	(4)
Foreign exchange and other	(1)	—	—	(1)
Allowance for credit loss as of January 26, 2019	$127	$ 64	$ 9	$200

Three months ended January 27, 2018	CREDIT LOSS ALLOWANCES			
	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Allowance for credit loss as of October 28, 2017	$160	$ 106	$ 23	$289
Provisions (benefits)	3	(13)	(10)	(20)
Foreign exchange and other	2	1	—	3
Allowance for credit loss as of January 27, 2018	$165	$ 94	$ 13	$272

Six months ended January 27, 2018	CREDIT LOSS ALLOWANCES			
	Lease Receivables	Loan Receivables	Financed Service Contracts	Total
Allowance for credit loss as of July 29, 2017	$162	$ 103	$ 30	$295
Provisions (benefits)	1	(11)	(16)	(26)
Foreign exchange and other	2	2	(1)	3
Allowance for credit loss as of January 27, 2018	$165	$ 94	$ 13	$272

We assess the allowance for credit loss related to financing receivables on either an individual or a collective basis. We consider various factors in evaluating lease and loan receivables and the earned portion of financed service contracts for possible impairment on an individual basis. These factors include our historical experience, credit quality and age of the receivable balances, and economic conditions that may affect a customer's ability to pay. When the evaluation indicates that it is probable that all amounts due pursuant to the contractual terms of the financing agreement, including scheduled interest payments, are unable to be collected, the financing receivable is considered impaired. All such outstanding amounts, including any accrued interest, will be assessed and fully reserved at the customer level. Our internal credit risk ratings are categorized as 1 through 10, with the lowest credit risk rating representing the highest quality financing receivables.

Typically, we also consider receivables with a risk rating of 8 or higher to be impaired and will include them in the individual assessment for allowance. These balances, as of January 26, 2019 and July 28, 2018, are presented under "(b) Credit Quality of Financing Receivables" above.

We evaluate the remainder of our financing receivables portfolio for impairment on a collective basis and record an allowance for credit loss at the portfolio segment level. When evaluating the financing receivables on a collective basis, we use expected default frequency rates published by a major third-party credit-rating agency as well as our own historical loss rate in the event of default, while also systematically giving effect to economic conditions, concentration of risk, and correlation.

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(d) Operating Leases

We provide financing of certain equipment through operating leases, and the amounts are included in property and equipment in the Consolidated Balance Sheets. Amounts relating to equipment on operating lease assets and the associated accumulated depreciation are summarized as follows (in millions):

	January 26, 2019	July 28, 2018
Operating lease assets	$ 529	$ 356
Accumulated depreciation	(370)	(238)
Operating lease assets, net	$ 159	$ 118

Minimum future rentals on noncancelable operating leases as of January 26, 2019 are summarized as follows (in millions):

Fiscal Year	Amount
2019 (remaining six months)	$ 81
2020	111
2021	48
2022	5
Total	$ 245

9. Available-for-Sale Debt Investments and Equity Investments

The following table summarizes our available-for-sale debt investments and equity investments (in millions):

	January 26, 2019	July 28, 2018
Available-for-sale debt investments	$ 30,486	$ 37,009
Marketable equity securities	62	605
Total investments	30,548	37,614
Non-marketable equity securities included in other assets [(1)]	1,133	978
Equity method investments included in other assets	115	118
Total	$ 31,796	$ 38,710

[(1)] We held equity interests in certain private equity funds of $0.6 billion as of January 26, 2019 which are accounted for under the NAV practical expedient following the adoption of ASU 2016-01, Financial Instruments, in the first quarter of fiscal 2019.

(a) Summary of Available-for-Sale Debt Investments

The following tables summarize our available-for-sale debt investments (in millions):

January 26, 2019	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
U.S. government securities	$ 3,486	$ —	$ (14)	$ 3,472
U.S. government agency securities	356	—	(2)	354
Non-U.S. government and agency securities	115	—	—	115
Corporate debt securities	25,103	16	(366)	24,753
U.S. agency mortgage-backed securities	1,475	1	(42)	1,434
Commercial paper	243	—	—	243
Certificates of deposit	115	—	—	115

Total [1]	$ 30,893	$ 17	$ (424)	$ 30,486

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July 28, 2018	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
U.S. government securities	$ 7,318	$ —	$ (43)	$7,275
U.S. government agency securities	732	—	(5)	727
Non-U.S. government and agency securities	209	—	(1)	208
Corporate debt securities	27,765	44	(445)	27,364
U.S. agency mortgage-backed securities	1,488	—	(53)	1,435
Total [1]	$ 37,512	$ 44	$ (547)	$37,009

[1] Net unsettled investment purchases were $4 million and net unsettled investment sales were $1.5 billion as of January 26, 2019 and July 28, 2018, respectively and were included in other current assets and other current liabilities.

Non-U.S. government and agency securities include agency and corporate debt securities that are guaranteed by non-U.S. governments.

The following table presents the gross realized gains and gross realized losses related to available-for-sale debt investments (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Gross realized gains	$1	$ 6	$3	$ 14
Gross realized losses	(6)	(102)	(14)	(106)
Total	$(5)	$ (96)	$(11)	$ (92)

The following tables present the breakdown of the available-for-sale debt investments with gross unrealized losses and the duration that those losses had been unrealized at January 26, 2019 and July 28, 2018 (in millions):

	UNREALIZED LOSSES LESS THAN 12 MONTHS		UNREALIZED LOSSES 12 MONTHS OR GREATER		TOTAL	
January 26, 2019	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
U.S. government securities	$ 6	$ —	$ 3,437	$ (14)	$3,443	$ (14)
U.S. government agency securities	—	—	344	(2)	344	(2)
Non-U.S. government and agency securities	—	—	115	—	115	—
Corporate debt securities	5,849	(61)	15,108	(305)	20,957	(366)
U.S. agency mortgage-backed securities	47	—	1,216	(42)	1,263	(42)
Total	$ 5,902	$ (61)	$ 20,220	$ (363)	$26,122	$ (424)

	UNREALIZED LOSSES LESS THAN 12 MONTHS		UNREALIZED LOSSES 12 MONTHS OR GREATER		TOTAL	
July 28, 2018	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
U.S. government securities	$ 2,966	$ (20)	$ 4,303	$ (23)	$7,269	$ (43)
U.S. government agency securities	206	(2)	521	(3)	727	(5)
Non-U.S. government and agency securities	105	(1)	103	—	208	(1)

Corporate debt securities	16,990	(344)	3,511	(101)	20,501	(445)
U.S. agency mortgage-backed securities	826	(24)	581	(29)	1,407	(53)
Total	$ 21,093	$ (391)	$ 9,019	$ (156)	$30,112	$ (547)

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There were no impairment charges related to our available-for-sale debt investments for the second quarter and first six months of fiscal 2019, and for the corresponding periods of fiscal 2018, respectively. For available-for-sale debt investments that were in an unrealized loss position as of January 26, 2019, we have determined that no other-than-temporary impairments were required to be recognized.

The following table summarizes the maturities of our available-for-sale debt investments as of January 26, 2019 (in millions):

	Amortized Cost	Fair Value
Within 1 year	$ 10,131	$ 10,104
After 1 year through 5 years	17,704	17,426
After 5 years through 10 years	1,568	1,507
After 10 years	15	15
Mortgage-backed securities with no single maturity	1,475	1,434
Total	$ 30,893	$ 30,486

Actual maturities may differ from the contractual maturities because borrowers may have the right to call or prepay certain obligations.

(b) Summary of Equity Investments

We recorded adjustments to the carrying value of our non-marketable equity securities measured using the measurement alternative during the second quarter and first six months of fiscal 2019 as follows (in millions):

	Three Months Ended January 26, 2019	Six Months Ended January 26, 2019
Adjustments to non-marketable equity securities measured using the measurement alternative:		
Upward adjustments	$ 14	$ 24
Downward adjustments, including impairments	(2)	(18)
Net upward adjustments	$ 12	$ 6

Gains and losses recognized on our marketable and non-marketable equity securities for the second quarter and first six months of fiscal 2019 are summarized below (in millions):

	Three Months Ended January 26, 2019	Six Months Ended January 26, 2019
Net gains and losses recognized during the period on equity investments	$ 67	$ 75
Less: Net gains and losses recognized on equity investments sold	5	(7)
Unrealized gains and losses recognized during reporting period on equity securities still held at the reporting date	$ 72	$ 68

(c) Securities Lending

We periodically engage in securities lending activities with certain of our available-for-sale debt investments. These transactions are accounted for as a secured lending of the securities, and the securities are typically loaned only on an overnight basis. The average daily balance of securities lending was $1.2 billion and $0.4 billion for the first six months of fiscal 2019 and fiscal 2018, respectively. We require collateral equal to at least 102% of the fair market value of the loaned security and that the collateral be in the form of cash or liquid, high-quality assets. We engage in these secured lending transactions only with highly creditworthy counterparties, and the associated portfolio custodian has agreed to indemnify us against collateral losses. We did not experience any losses in connection with the secured lending of securities during the periods presented. As of January 26, 2019 and July 28, 2018, we had no outstanding securities lending transactions.

(d) Variable Interest Entities

In the ordinary course of business, we have investments in privately held companies and provide financing to certain customers. These privately held companies and customers may be considered to be variable interest entities. We evaluate on an ongoing basis our investments in these privately held companies and our customer financings, and have determined that as of January 26, 2019, except as disclosed in Note 1, there were no significant variable interest entities required to be consolidated in our Consolidated Financial Statements.

As of January 26, 2019, the carrying value of investments in privately held companies was $1.25 billion, of which $670 million of such investments are considered to be in variable interest entities which are unconsolidated. In addition, we have additional funding commitments of $192 million related to these investments, some of which are based on the achievement of certain agreed-upon milestones, and some of which are required to be funded on demand. The carrying value of these investments and the additional funding commitments collectively represent our maximum exposure related to these variable interest entities.

10. Fair Value

Fair value is defined as the price that would be received from selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. When determining the fair value measurements for assets and liabilities required or permitted to be either recorded or disclosed at fair value, we consider the principal or most advantageous market in which we would transact, and we also consider assumptions that market participants would use when pricing the asset or liability.

(a) Fair Value Hierarchy

The accounting guidance for fair value measurement requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard establishes a fair value hierarchy based on the level of independent, objective evidence surrounding the inputs used to measure fair value. A financial instrument's categorization within the fair value hierarchy is based upon the lowest level of input that is significant to the fair value measurement. The fair value hierarchy is as follows:

Level 1 applies to assets or liabilities for which there are quoted prices in active markets for identical assets or liabilities.

Level 2 applies to assets or liabilities for which there are inputs other than quoted prices that are observable for the asset or liability, such as quoted prices for similar assets or liabilities in active markets; quoted prices for identical assets or liabilities in markets with insufficient volume or infrequent transactions (less active markets); or model-derived valuations in which significant inputs are observable or can be derived principally from, or corroborated by, observable market data.

Level 3 applies to assets or liabilities for which there are unobservable inputs to the valuation methodology that are significant to the measurement of the fair value of the assets or liabilities.

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(b) Assets and Liabilities Measured at Fair Value on a Recurring Basis

Assets and liabilities measured at fair value on a recurring basis were as follows (in millions):

	JANUARY 26, 2019 FAIR VALUE MEASUREMENTS			JULY 28, 2018 FAIR VALUE MEASUREMENTS		
	Level 1	Level 2	Total Balance	Level 1	Level 2	Total Balance
Assets:						
Cash equivalents:						
Money market funds	$7,888	$—	$7,888	$6,890	$—	$6,890
Commercial paper	—	99	99	—	—	—
Certificates of deposit	—	25	25	—	—	—
Available-for-sale debt investments:						
U.S. government securities	—	3,472	3,472	—	7,275	7,275
U.S. government agency securities	—	354	354	—	727	727
Non-U.S. government and agency securities	—	115	115	—	208	208
Corporate debt securities	—	24,753	24,753	—	27,364	27,364
U.S. agency mortgage-backed securities	—	1,434	1,434	—	1,435	1,435
Commercial paper	—	243	243	—	—	—
Certificates of deposit	—	115	115	—	—	—
Equity investments:						
Marketable equity securities	62	—	62	605	—	605
Derivative assets	—	23	23	—	2	2
Total	$7,950	$30,633	$38,583	$7,495	$37,011	$44,506
Liabilities:						
Derivative liabilities	$—	$40	$40	$—	$74	$74
Total	$—	$40	$40	$—	$74	$74

Level 1 marketable equity securities are determined by using quoted prices in active markets for identical assets. Level 2 available-for-sale debt investments are priced using quoted market prices for similar instruments or nonbinding market prices that are corroborated by observable market data. We use inputs such as actual trade data, benchmark yields, broker/dealer quotes, and other similar data, which are obtained from quoted market prices, independent pricing vendors, or other sources, to determine the ultimate fair value of these assets and liabilities. We use such pricing data as the primary input to make our assessments and determinations as to the ultimate valuation of our investment portfolio and have not made, during the periods presented, any material adjustments to such inputs. We are ultimately responsible for the financial statements and underlying estimates. Our derivative instruments are primarily classified as Level 2, as they are not actively traded and are valued using pricing models that use observable market inputs. We did not have any transfers between Level 1 and Level 2 fair value measurements during the periods presented.

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(c) Assets Measured at Fair Value on a Nonrecurring Basis

The following table presents gains and losses on assets that were measured at fair value on a nonrecurring basis (in millions):

	TOTAL GAINS (LOSSES) FOR THE THREE MONTHS ENDED		TOTAL GAINS (LOSSES) FOR THE SIX MONTHS ENDED	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Non-marketable equity securities	$ 12	$ (18)	$ 6	$ (39)
Property held for sale—land and buildings	—	20	—	20
Total gains (losses) for nonrecurring measurements	$ 12	$ 2	$ 6	$ (19)

These assets were measured at fair value due to events or circumstances we identified as having significant impact on their fair value during the respective periods. The carrying value of our non-marketable equity securities recorded to fair value on a non-recurring basis is adjusted for observable transactions for identical or similar investments of the same issuer or impairment. These securities are classified as Level 3 in the fair value hierarchy because we estimate the value based on valuation methods using the observable transaction price at the transaction date and other unobservable inputs such as volatility, rights, and obligations of the securities we hold.

The fair value of property held for sale was measured with the assistance of third-party valuation models, which used discounted cash flow techniques as part of their analysis. The fair value measurement was categorized as Level 3, as significant unobservable inputs were used in the valuation report. The impairment charge as a result of the valuations, which represented the difference between the fair value less cost to sell and the carrying amount of the assets held for sale, was included in restructuring and other charges. The remaining carrying value of property held for sale that was impaired was zero as of January 27, 2018.

(d) Other Fair Value Disclosures

The fair value of short-term loan receivables and financed service contracts approximates their carrying value due to their short duration. The aggregate carrying value of long-term loan receivables and financed service contracts as of January 26, 2019 and July 28, 2018 was $3.3 billion and $3.6 billion, respectively. The estimated fair value of long-term loan receivables and financed service contracts approximates their carrying value. We use significant unobservable inputs in determining discounted cash flows to estimate the fair value of our long-term loan receivables and financed service contracts, and therefore they are categorized as Level 3.

As of January 26, 2019, the estimated fair value of our short-term debt approximates its carrying value due to the short maturities. As of January 26, 2019, the fair value of our senior notes and other long-term debt was $26.5 billion with a carrying amount of $25.6 billion. This compares to a fair value of $26.4 billion and a carrying amount of $25.6 billion as of July 28, 2018. The fair value of the senior notes and other long-term debt was determined based on observable market prices in a less active market and was categorized as Level 2 in the fair value hierarchy.

11. Borrowings

(a) Short-Term Debt

The following table summarizes our short-term debt (in millions, except percentages):

	January 26, 2019	July 28, 2018

	Amount	Effective Rate	Amount	Effective Rate
Current portion of long-term debt	$9,737	3.62 %	$5,238	3.46 %

We repaid our senior notes due on February 15, 2019 for an aggregate principal amount of $2.0 billion upon maturity.
We have a short-term debt financing program of up to $10.0 billion through the issuance of commercial paper notes. We use the proceeds from the issuance of commercial paper notes for general corporate purposes. We had no commercial paper notes outstanding as of January 26, 2019 and July 28, 2018. As of February 18, 2019, we had approximately $2 billion of commercial paper notes outstanding.
The effective rates for the short- and long-term debt include the interest on the notes, the accretion of the discount, the issuance costs, and, if applicable, adjustments related to hedging.

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(b) Long-Term Debt
The following table summarizes our long-term debt (in millions, except percentages):

		January 26, 2019		July 28, 2018	
	Maturity Date	Amount	Effective Rate	Amount	Effective Rate
Senior notes:					
Floating-rate notes:					
Three-month LIBOR plus 0.50%	March 1, 2019	$500	3.30%	$500	2.86%
Three-month LIBOR plus 0.34%	September 20, 2019	500	3.17%	500	2.71%
Fixed-rate notes:					
4.95%	February 15, 2019	2,000	5.28%	2,000	5.17%
1.60%	February 28, 2019	1,000	1.67%	1,000	1.67%
2.125%	March 1, 2019	1,750	3.13%	1,750	2.71%
1.40%	September 20, 2019	1,500	1.48%	1,500	1.48%
4.45%	January 15, 2020	2,500	4.87%	2,500	4.52%
2.45%	June 15, 2020	1,500	2.54%	1,500	2.54%
2.20%	February 28, 2021	2,500	2.30%	2,500	2.30%
2.90%	March 4, 2021	500	3.28%	500	2.86%
1.85%	September 20, 2021	2,000	1.90%	2,000	1.90%
3.00%	June 15, 2022	500	3.55%	500	3.11%
2.60%	February 28, 2023	500	2.68%	500	2.68%
2.20%	September 20, 2023	750	2.27%	750	2.27%
3.625%	March 4, 2024	1,000	3.40%	1,000	2.98%
3.50%	June 15, 2025	500	3.71%	500	3.27%
2.95%	February 28, 2026	750	3.01%	750	3.01%
2.50%	September 20, 2026	1,500	2.55%	1,500	2.55%
5.90%	February 15, 2039	2,000	6.11%	2,000	6.11%
5.50%	January 15, 2040	2,000	5.67%	2,000	5.67%
Total		25,750		25,750	
Unaccreted discount/issuance costs		(107)		(116)	
Hedge accounting fair value adjustments		(13)		(65)	
Total		$25,630		$25,569	
Reported as:					
Current portion of long-term debt		$9,737		$5,238	
Long-term debt		15,893		20,331	
Total		$25,630		$25,569	

We entered into interest rate swaps in prior periods with an aggregate notional amount of $6.75 billion designated as fair value hedges of certain of our fixed-rate senior notes. These swaps convert the fixed interest rates of the fixed-rate notes to floating interest rates based on the London InterBank Offered Rate ("LIBOR"). The gains and losses related to changes in the fair value of the interest rate swaps substantially offset changes in the fair value of the hedged portion of the underlying debt that are attributable to the changes in market interest rates. For additional information, see Note 12.

Interest is payable semiannually on each class of the senior fixed-rate notes and payable quarterly on the floating-rate notes. Each of the senior fixed-rate notes is redeemable by us at any time, subject to a make-whole premium. The senior notes rank at par with the commercial paper notes that may be issued in the future pursuant to our short-term debt financing program, as discussed above under “(a) Short-Term Debt.” As of January 26, 2019, we were in compliance with all debt covenants.

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As of January 26, 2019, future principal payments for long-term debt, including the current portion, are summarized as follows (in millions):

Fiscal Year	Amount
2019 (remaining six months)	$5,250
2020	6,000
2021	3,000
2022	2,500
2023	500
Thereafter	8,500
Total	$25,750

(c) Credit Facility

On May 15, 2015, we entered into a credit agreement with certain institutional lenders that provides for a $3.0 billion unsecured revolving credit facility that is scheduled to expire on May 15, 2020. Any advances under the credit agreement will accrue interest at rates that are equal to, based on certain conditions, either (i) the highest of (a) the Federal Funds rate plus 0.50%, (b) Bank of America’s “prime rate” as announced from time to time, or (c) LIBOR, or a comparable or successor rate that is approved by the Administrative Agent (“Eurocurrency Rate”), for an interest period of one-month plus 1.00%, or (ii) the Eurocurrency Rate, plus a margin that is based on our senior debt credit ratings as published by Standard & Poor’s Financial Services, LLC and Moody’s Investors Service, Inc., provided that in no event will the Eurocurrency Rate be less than zero. We may also, upon the agreement of either the then-existing lenders or additional lenders not currently parties to the agreement, increase the commitments under the credit facility by up to an additional $2.0 billion and/or extend the expiration date of the credit facility up to May 15, 2022.

This credit agreement requires that we comply with certain covenants, including that we maintain an interest coverage ratio as defined in the agreement. As of January 26, 2019, we were in compliance with the required interest coverage ratio and the other covenants, and we had not borrowed any funds under this credit facility.

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12. Derivative Instruments

(a) Summary of Derivative Instruments

We use derivative instruments primarily to manage exposures to foreign currency exchange rate, interest rate, and equity price risks. Our primary objective in holding derivatives is to reduce the volatility of earnings and cash flows associated with changes in foreign currency exchange rates, interest rates, and equity prices. Our derivatives expose us to credit risk to the extent that the counterparties may be unable to meet the terms of the agreement. We do, however, seek to mitigate such risks by limiting our counterparties to major financial institutions. In addition, the potential risk of loss with any one counterparty resulting from this type of credit risk is monitored. Management does not expect material losses as a result of defaults by counterparties.

The fair values of our derivative instruments and the line items on the Consolidated Balance Sheets to which they were recorded are summarized as follows (in millions):

	DERIVATIVE ASSETS			DERIVATIVE LIABILITIES		
	Balance Sheet Line Item	January 26, 2019	July 28, 2018	Balance Sheet Line Item	January 26, 2019	July 28, 2018
Derivatives designated as hedging instruments:						
Foreign currency derivatives	Other current assets	$ 1	$ 1	Other current liabilities	$ 8	$ —
Interest rate derivatives	Other current assets	—	—	Other current liabilities	13	10
Interest rate derivatives	Other assets	12	—	Other long-term liabilities	15	62
Total		13	1		36	72
Derivatives not designated as hedging instruments:						
Foreign currency derivatives	Other current assets	10	1	Other current liabilities	4	2
Total		10	1		4	2
Total		$ 23	$ 2		$ 40	$ 74

The effects of our cash flow and net investment hedging instruments on other comprehensive income (OCI) and the Consolidated Statements of Operations are summarized as follows (in millions):

	GAINS (LOSSES) RECOGNIZED IN OCI ON DERIVATIVES FOR THE THREE MONTHS ENDED (EFFECTIVE PORTION)		GAINS (LOSSES) RECLASSIFIED FROM AOCI INTO INCOME FOR THE THREE MONTHS ENDED (EFFECTIVE PORTION)		
	January 26, 2019	January 27, 2018	Line Item in Statements of Operations	January 26, 2019	January 27, 2018
Derivatives designated as cash flow hedging instruments:					
Foreign currency derivatives	$ (6)	$ 30	Revenue — product	$ 1	$ —
			Revenue — service	1	—
			Cost of sales — service	(1)	4
			Operating expenses	—	14
Total	$ (6)	$ 30		$ 1	$ 18

Derivatives designated as net investment hedging instruments:					
Foreign currency derivatives	$ (1)	$ (12)	Other income (loss), net	$ —	$ —

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GAINS (LOSSES) RECOGNIZED IN OCI ON DERIVATIVES FOR THE SIX MONTHS ENDED (EFFECTIVE PORTION)			GAINS (LOSSES) RECLASSIFIED FROM AOCI INTO INCOME FOR THE SIX MONTHS ENDED (EFFECTIVE PORTION)		
	January 26, 2019	January 27, 2018	Line Item in Statements of Operations	January 26, 2019	January 27, 2018
Derivatives designated as cash flow hedging instruments:					
Foreign currency derivatives	$ (10)	$ 38	Revenue — product	$ 1	$ —
			Revenue — service	2	—
			Cost of sales — service	(1)	7
			Operating expenses	(1)	24
Total	$ (10)	$ 38		$ 1	$ 31
Derivatives designated as net investment hedging instruments:					
Foreign currency derivatives	$ 3	$ (17)	Other income (loss), net	$ —	$ —

As of January 26, 2019, we estimate that approximately $9 million of net derivative losses related to our cash flow hedges included in accumulated other comprehensive income (AOCI) will be reclassified into earnings within the next 12 months when the underlying hedged item impacts earnings.

The effect on the Consolidated Statements of Operations of derivative instruments designated as fair value hedges and the underlying hedged items is summarized as follows (in millions):

		GAINS (LOSSES) ON DERIVATIVE INSTRUMENTS FOR THE THREE MONTHS ENDED		GAINS (LOSSES) RELATED TO HEDGED ITEMS FOR THE THREE MONTHS ENDED	
Derivatives Designated as Fair Value Hedging Instruments	Line Item in Statements of Operations	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Interest rate derivatives	Interest expense	$ 64	$ (63)	$ (61)	$ 63
Equity derivatives	Other income (loss), net	—	(35)	—	35
Total		$ 64	$ (98)	$ (61)	$ 98
		GAINS (LOSSES) ON DERIVATIVE INSTRUMENTS FOR THE		GAINS (LOSSES) RELATED TO HEDGED ITEMS FOR THE	

Derivatives Designated as Fair Value Hedging Instruments	Line Item in Statements of Operations	SIX MONTHS ENDED January 26, 2019	SIX MONTHS ENDED January 27, 2018	SIX MONTHS ENDED January 26, 2019	SIX MONTHS ENDED January 27, 2018
Interest rate derivatives	Interest expense	$ 55	$ (109)	$(52)	$ 109
Equity derivatives	Other income (loss), net	—	(49)	—	49
Total		$ 55	$ (158)	$(52)	$ 158

The effect on the Consolidated Statements of Operations of derivative instruments not designated as hedges is summarized as follows (in millions):

Derivatives Not Designated as Hedging Instruments	Line Item in Statements of Operations	GAINS (LOSSES) FOR THE THREE MONTHS ENDED January 26, 2019	GAINS (LOSSES) FOR THE THREE MONTHS ENDED January 27, 2018	GAINS (LOSSES) FOR THE SIX MONTHS ENDED January 26, 2019	GAINS (LOSSES) FOR THE SIX MONTHS ENDED January 27, 2018
Foreign currency derivatives	Other income (loss), net	$ (1)	$ 66	$ (28)	$ 73
Total return swaps—deferred compensation	Operating expenses	(9)	39	(33)	54
	Cost of sales — product	—	1	(1)	1
	Cost of sales — service	(1)	1	(2)	2
	Other income (loss), net	(4)	(3)	(8)	(5)
Equity derivatives	Other income (loss), net	—	2	1	3
Total		$ (15)	$ 106	$ (71)	$ 128

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The notional amounts of our outstanding derivatives are summarized as follows (in millions):

	January 26, 2019	July 28, 2018
Derivatives designated as hedging instruments:		
Foreign currency derivatives—cash flow hedges	$ 890	$ 147
Interest rate derivatives	6,750	6,750
Net investment hedging instruments	299	250
Derivatives not designated as hedging instruments:		
Foreign currency derivatives	2,643	2,298
Total return swaps—deferred compensation	536	566
Total	$ 11,118	$ 10,011

(b) Offsetting of Derivative Instruments

We present our derivative instruments at gross fair values in the Consolidated Balance Sheets. However, our master netting and other similar arrangements with the respective counterparties allow for net settlement under certain conditions, which are designed to reduce credit risk by permitting net settlement with the same counterparty. To further limit credit risk, we also enter into collateral security arrangements related to certain derivative instruments whereby cash is posted as collateral between the counterparties based on the fair market value of the derivative instrument. Information related to these offsetting arrangements is summarized as follows (in millions):

	January 26, 2019					
	GROSS AMOUNTS OFFSET IN THE CONSOLIDATED BALANCE SHEETS			GROSS AMOUNTS NOT OFFSET IN THE CONSOLIDATED BALANCE SHEETS BUT WITH LEGAL RIGHTS TO OFFSET		
	Gross Amounts Recognized	Gross Amounts Offset	Net Amounts Presented	Gross Derivative Amounts	Cash Collateral	Net Amount
Derivatives assets	$ 23	$ —	$ 23	$ (12)	$ (11)	$ —
Derivatives liabilities	$ 40	$ —	$ 40	$ (12)	$ (19)	$ 9

	July 28, 2018					
	GROSS AMOUNTS OFFSET IN THE CONSOLIDATED BALANCE SHEETS			GROSS AMOUNTS NOT OFFSET IN THE CONSOLIDATED BALANCE SHEETS BUT WITH LEGAL RIGHTS TO OFFSET		
	Gross Amounts Recognized	Gross Amounts Offset	Net Amounts Presented	Gross Derivative Amounts	Cash Collateral	Net Amount
Derivatives assets	$ 2	$ —	$ 2	$ (2)	$ —	$ —
Derivatives liabilities	$ 74	$ —	$ 74	$ (2)	$ (53)	$ 19

(c) Foreign Currency Exchange Risk

We conduct business globally in numerous currencies. Therefore, we are exposed to adverse movements in foreign currency exchange rates. To limit the exposure related to foreign currency changes, we enter into foreign currency contracts. We do not enter into such contracts for speculative purposes.

We hedge forecasted foreign currency transactions related to certain revenues, operating expenses and service cost of sales with currency options and forward contracts. These currency options and forward contracts, designated as cash flow hedges, generally have maturities of less than 24 months. We assess effectiveness based on changes in total fair value of the derivatives. The effective portion of the derivative instrument's gain or loss is initially reported as a component of AOCI and subsequently reclassified into earnings when the hedged exposure affects earnings. The ineffective portion, if any, of the gain or loss is reported in earnings immediately. During the periods presented, we did not discontinue any cash flow hedges for which it was probable that a forecasted transaction would not occur.

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We enter into foreign exchange forward and option contracts to reduce the short-term effects of foreign currency fluctuations on assets and liabilities such as foreign currency receivables, including long-term customer financings, investments, and payables. These derivatives are not designated as hedging instruments. Gains and losses on the contracts are included in other income (loss), net, and substantially offset foreign exchange gains and losses from the remeasurement of intercompany balances or other current assets, investments, or liabilities denominated in currencies other than the functional currency of the reporting entity.
We hedge certain net investments in our foreign operations with forward contracts to reduce the effects of foreign currency fluctuations on our net investment in those foreign subsidiaries. These derivative instruments generally have maturities of up to six months.
(d) Interest Rate Risk
Interest Rate Derivatives, Investments   Our primary objective for holding available-for-sale debt investments is to achieve an appropriate investment return consistent with preserving principal and managing risk. To realize these objectives, we may utilize interest rate swaps or other derivatives designated as fair value or cash flow hedges. As of January 26, 2019 and July 28, 2018, we did not have any outstanding interest rate derivatives related to our available-for-sale debt investments.
Interest Rate Derivatives Designated as Fair Value Hedges, Long-Term Debt In the first six months of fiscal 2019, we did not enter into any interest rate swaps. In prior fiscal years, we entered into interest rate swaps designated as fair value hedges related to fixed-rate senior notes that are due in fiscal 2019 through 2025. Under these interest rate swaps, we receive fixed-rate interest payments and make interest payments based on LIBOR plus a fixed number of basis points. The effect of such swaps is to convert the fixed interest rates of the senior fixed-rate notes to floating interest rates based on LIBOR. The gains and losses related to changes in the fair value of the interest rate swaps are included in interest expense and substantially offset changes in the fair value of the hedged portion of the underlying debt that are attributable to the changes in market interest rates. The fair value of the interest rate swaps was reflected in other assets and other current and long-term liabilities.
(e) Equity Price Risk
We may hold equity securities for strategic purposes or to diversify our overall investment portfolio. The marketable equity securities in our portfolio are subject to price risk. To manage our exposure to changes in the fair value of certain equity securities, we have periodically entered into equity derivatives that are designated as fair value hedges. The changes in the value of the hedging instruments are included in other income (loss), net, and offset the change in the fair value of the underlying hedged investment. In addition, we periodically enter into equity derivatives that are not designated as accounting hedges. The changes in the fair value of these derivatives are also included in other income (loss), net.
We are also exposed to variability in compensation charges related to certain deferred compensation obligations to employees. Although not designated as accounting hedges, we utilize derivatives such as total return swaps to economically hedge this exposure.
(f) Hedge Effectiveness
For the periods presented, amounts excluded from the assessment of hedge effectiveness were not material for fair value, cash flow, and net investment hedges. In addition, hedge ineffectiveness for fair value, cash flow, and net investment hedges was not material for any of the periods presented.

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13. Commitments and Contingencies

(a) Operating Leases

We lease office space in many U.S. locations. Outside the United States, larger leased sites include sites in Australia, Belgium, Canada, China, Germany, India, Japan, Mexico, Poland and the United Kingdom. We also lease equipment and vehicles. Future minimum lease payments under all noncancelable operating leases with an initial term in excess of one year as of January 26, 2019 are as follows (in millions):

Fiscal Year	Amount
2019 (remaining six months)	$ 214
2020	331
2021	233
2022	163
2023	106
Thereafter	117
Total	$ 1,164

(b) Purchase Commitments with Contract Manufacturers and Suppliers

We purchase components from a variety of suppliers and use several contract manufacturers to provide manufacturing services for our products. During the normal course of business, in order to manage manufacturing lead times and help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that either allow them to procure inventory based upon criteria as defined by us or establish the parameters defining our requirements. A significant portion of our reported purchase commitments arising from these agreements consists of firm, noncancelable, and unconditional commitments. Certain of these purchase commitments with contract manufacturers and suppliers relate to arrangements to secure long-term pricing for certain product components for multi-year periods. In certain instances, these agreements allow us the option to cancel, reschedule, and adjust our requirements based on our business needs prior to firm orders being placed.

The following table summarizes our purchase commitments with contract manufacturers and suppliers (in millions):

Commitments by Period	January 26, 2019	July 28, 2018
Less than 1 year	$ 5,366	$ 5,407
1 to 3 years	731	710
3 to 5 years	180	360
Total	$ 6,277	$ 6,477

We record a liability for firm, noncancelable, and unconditional purchase commitments for quantities in excess of our future demand forecasts consistent with the valuation of our excess and obsolete inventory. As of January 26, 2019 and July 28, 2018, the liability for these purchase commitments was $148 million and $159 million, respectively, and was included in other current liabilities.

(c) Other Commitments

In connection with our acquisitions, we have agreed to pay certain additional amounts contingent upon the achievement of certain agreed-upon technology, development, product, or other milestones or upon the continued employment with Cisco of certain employees of the acquired entities.

The following table summarizes the compensation expense related to acquisitions (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Compensation expense related to acquisitions	$ 66	$ 46	$ 175	$ 88

As of January 26, 2019, we estimated that future cash compensation expense of up to $528 million may be required to be recognized pursuant to the applicable business combination agreements.

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We also have certain funding commitments, primarily related to our non-marketable equity and other investments, some of which are based on the achievement of certain agreed-upon milestones, and some of which are required to be funded on demand. The funding commitments were $357 million and $223 million as of January 26, 2019 and July 28, 2018, respectively.

(d) Product Warranties

The following table summarizes the activity related to the product warranty liability (in millions):

	Six Months Ended	
	January 26, 2019	January 27, 2018
Balance at beginning of period	$ 359	$ 407
Provisions for warranties issued	297	287
Adjustments for pre-existing warranties	(5)	(21)
Settlements	(300)	(292)
Acquisitions and divestitures	(2)	—
Balance at end of period	$ 349	$ 381

We accrue for warranty costs as part of our cost of sales based on associated material product costs, labor costs for technical support staff, and associated overhead. Our products are generally covered by a warranty for periods ranging from 90 days to five years, and for some products we provide a limited lifetime warranty.

(e) Financing and Other Guarantees

In the ordinary course of business, we provide financing guarantees for various third-party financing arrangements extended to channel partners and end-user customers. Payments under these financing guarantee arrangements were not material for the periods presented.

Channel Partner Financing Guarantees   We facilitate arrangements for third-party financing extended to channel partners, consisting of revolving short-term financing, generally with payment terms ranging from 60 to 90 days. These financing arrangements facilitate the working capital requirements of the channel partners, and, in some cases, we guarantee a portion of these arrangements. The volume of channel partner financing was $7.3 billion and $6.9 billion for the second quarter of fiscal 2019 and fiscal 2018, respectively, and was $14.5 billion and $13.6 billion for the first six months of fiscal 2019 and fiscal 2018, respectively. The balance of the channel partner financing subject to guarantees was $1.3 billion and $1.0 billion as of January 26, 2019 and July 28, 2018, respectively.

End-User Financing Guarantees   We also provide financing guarantees for third-party financing arrangements extended to end-user customers related to leases and loans, which typically have terms of up to three years. The volume of financing provided by third parties for leases and loans as to which we had provided guarantees was $6 million and $12 million for the second quarter of fiscal 2019 and fiscal 2018, respectively, and was $9 million and $26 million for the first six months of fiscal 2019 and fiscal 2018, respectively.

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Financing Guarantee Summary   The aggregate amounts of financing guarantees outstanding at January 26, 2019 and July 28, 2018, representing the total maximum potential future payments under financing arrangements with third parties along with the related deferred revenue, are summarized in the following table (in millions):

	January 26, 2019	July 28, 2018
Maximum potential future payments relating to financing guarantees:		
Channel partner	$ 338	$ 277
End user	25	31
Total	$ 363	$ 308
Deferred revenue associated with financing guarantees:		
Channel partner	$ (67)	$ (94)
End user	(19)	(28)
Total	$ (86)	$ (122)
Maximum potential future payments relating to financing guarantees, net of associated deferred revenue	$ 277	$ 186

Other Guarantees   Our other guarantee arrangements as of January 26, 2019 and July 28, 2018 that were subject to recognition and disclosure requirements were not material.

(f) Indemnifications

In the normal course of business, we indemnify other parties, including customers, lessors, and parties to other transactions with us, with respect to certain matters. We have agreed to indemnify against losses arising from a breach of representations or covenants or out of intellectual property infringement or other claims made against certain parties. These agreements may limit the time within which an indemnification claim can be made and the amount of the claim.

We have been asked to indemnify Time Warner Cable ("TWC") for patent infringement claims asserted against it by Sprint Communications Company, L.P. ("Sprint") in federal court in Kansas. Sprint alleges that TWC infringed certain Sprint patents by offering VoIP telephone services utilizing products provided by us generally in combination with those of other manufacturers. Sprint seeks monetary damages. Following a trial on March 3, 2017, a jury in Kansas found that TWC willfully infringed five Sprint patents and awarded Sprint $139.8 million in damages. On March 14, 2017, the Kansas court declined Sprint's request for enhanced damages and entered judgment in favor of Sprint for $139.8 million plus 1.06% in post-judgment interest. On May 30, 2017, the Court awarded Sprint $20.3 million in pre-judgment interest and denied TWC's post-trial motions. TWC appealed to the U.S. Court of Appeals for the Federal Circuit, and, on November 30, 2018, a panel of the court affirmed the judgment. TWC filed a petition for rehearing en banc on January 29, 2019. Due to the uncertainty surrounding the litigation process, we are unable to reasonably estimate the ultimate outcome of the TWC litigation at this time. Should Sprint prevail in litigation, or TWC agree to a settlement, we, in accordance with our agreements, may have an obligation to indemnify TWC. At this time, we do not anticipate that our obligations regarding the final outcome would be material.

During the first six months of fiscal 2018, we recorded legal and indemnification settlement charges of $127 million to product cost of sales related to prior indemnification matters resolved in fiscal 2018.

In addition, we have entered into indemnification agreements with our officers and directors, and our Amended and Restated Bylaws contain similar indemnification obligations to our agents.

It is not possible to determine the maximum potential amount under these indemnification agreements due to our limited history with prior indemnification claims and the unique facts and circumstances involved in each particular agreement. Historically, payments made by us under these agreements have not had a material effect on our operating results, financial position, or cash flows.

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(g) Legal Proceedings

Brazil Brazilian authorities have investigated our Brazilian subsidiary and certain of our former employees, as well as a Brazilian importer of our products, and its affiliates and employees, relating to alleged evasion of import taxes and alleged improper transactions involving the subsidiary and the importer. Brazilian tax authorities have assessed claims against our Brazilian subsidiary based on a theory of joint liability with the Brazilian importer for import taxes, interest, and penalties. In addition to claims asserted by the Brazilian federal tax authorities in prior fiscal years, tax authorities from the Brazilian state of Sao Paulo have asserted similar claims on the same legal basis in prior fiscal years.

The asserted claims by Brazilian federal tax authorities that remain are for calendar years 2003 through 2007, and the asserted claims by the tax authorities from the state of Sao Paulo are for calendar years 2005 through 2007. The total asserted claims by Brazilian state and federal tax authorities aggregate to $215 million for the alleged evasion of import and other taxes, $1.4 billion for interest, and $1.0 billion for various penalties, all determined using an exchange rate as of January 26, 2019. We have completed a thorough review of the matters and believe the asserted claims against our Brazilian subsidiary are without merit, and we are defending the claims vigorously. While we believe there is no legal basis for the alleged liability, due to the complexities and uncertainty surrounding the judicial process in Brazil and the nature of the claims asserting joint liability with the importer, we are unable to determine the likelihood of an unfavorable outcome against our Brazilian subsidiary and are unable to reasonably estimate a range of loss, if any. We do not expect a final judicial determination for several years.

SRI International On September 4, 2013, SRI International, Inc. (“SRI”) asserted patent infringement claims against us in the U.S. District Court for the District of Delaware, accusing our products and services in the area of network intrusion detection of infringing two U.S. patents. SRI sought monetary damages of at least a reasonable royalty and enhanced damages. The trial on these claims began on May 2, 2016 and, on May 12, 2016, the jury returned a verdict finding willful infringement of the asserted patents. The jury awarded SRI damages of $23.7 million. On May 25, 2017, the Court awarded SRI enhanced damages and attorneys’ fees, entered judgment in the new amount of $57.0 million, and ordered an ongoing royalty of 3.5% through the expiration of the patents in 2018. We have appealed to the United States Court of Appeals for the Federal Circuit on various grounds. We believe we have strong arguments to overturn the jury verdict and/or reduce the damages award. While the ultimate outcome of the case may still result in a loss, we do not expect it to be material.

Straight Path On September 24, 2014, Straight Path IP Group, Inc. (“Straight Path”) asserted patent infringement claims against us in the U.S. District Court for the Northern District of California, accusing our 9971 IP Phone, Unified Communications Manager working in conjunction with 9971 IP Phones, and Video Communication Server products of infringement. All of the asserted patents have expired and Straight Path was therefore limited to seeking monetary damages for the alleged past infringement. On November 13, 2017, the Court granted our motion for summary judgment of non-infringement, thereby dismissing Straight Path's claims against us and cancelling a trial which had been set for March 12, 2018. Straight Path appealed to the U.S. Court of Appeal for the Federal Circuit, and, on January 23, 2019, the court summarily affirmed the finding of non-infringement.

Arista Networks, Inc. As reported in our Form 10-K for the fiscal year ended July 28, 2018 we received a payment of $400 million from Arista Networks, Inc. ("Arista") in connection with the settlement of litigation. The payment was recognized in general and administrative expenses in our first quarter of fiscal 2019.

Oyster Optics On November 24, 2016, Oyster Optics, LLC (“Oyster”) asserted patent infringement claims against us in the U.S. District Court for the Eastern District of Texas. Oyster alleges that certain Cisco ONS 15454 and NCS 2000 line cards infringe U.S. Patent No. 7,620,327 (“the ‘327 Patent”). Oyster seeks monetary damages. Oyster filed infringement claims based on the ‘327 Patent against other defendants, including ZTE, Nokia, NEC, Infinera, Huawei, Ciena, Alcatel-Lucent, and Fujitsu, and the court consolidated the cases alleging infringement of the ‘327 Patent. Oyster's cases against some of the defendants were resolved. The court vacated the November 4, 2018 trial date set for

Oyster's claims against Cisco and one other remaining defendant, pending resolution of Oyster's appeal of the court's summary judgment ruling dismissing certain of Oyster's claims. While we believe that we have strong non-infringement arguments and that the patent is invalid, if we do not prevail in the District Court, we believe damages ultimately assessed would not be material. Due to uncertainty surrounding patent litigation processes, we are unable to reasonably estimate the ultimate outcome of this litigation at this time. However, we do not anticipate that any final outcome of the dispute would be material.

In addition, we are subject to legal proceedings, claims, and litigation arising in the ordinary course of business, including intellectual property litigation. While the outcome of these matters is currently not determinable, we do not expect that the ultimate costs to resolve these matters will have a material adverse effect on our consolidated financial position, results of operations, or cash flows. For additional information regarding intellectual property litigation, see “Part II, Item 1A. Risk Factors-We may be found to infringe on intellectual property rights of others” herein.

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14. Shareholders' Equity
(a) Cash Dividends on Shares of Common Stock
We declared and paid cash dividends of $0.33 and $0.29 per common share, or $1.5 billion and $1.4 billion, on our outstanding common stock for the second quarter of fiscal 2019 and fiscal 2018, respectively. We declared and paid cash dividends of $0.66 and $0.58 per common share, or $3.0 billion and $2.9 billion, on our outstanding common stock for the first six months of fiscal 2019 and fiscal 2018, respectively.
On February 13, 2019, our Board of Directors declared a quarterly dividend of $0.35 per common share to be paid on April 24, 2019 to all shareholders of record as of the close of business on April 5, 2019. Any future dividends will be subject to the approval of our Board of Directors.
(b) Stock Repurchase Program
In September 2001, our Board of Directors authorized a stock repurchase program. On February 13, 2019, our Board of Directors authorized a $15 billion increase to the stock repurchase program. The remaining authorized amount for stock repurchases under this program, including the additional authorization, is approximately $24 billion with no termination date. A summary of the stock repurchase activity for fiscal 2019 and 2018 under the stock repurchase program, reported based on the trade date, is summarized as follows (in millions, except per-share amounts):

Quarter Ended	Shares	Weighted-Average Price per Share	Amount
Fiscal 2019			
January 26, 2019	111	$ 45.09	$ 5,016
October 27, 2018	109	$ 46.01	$ 5,026
Fiscal 2018			
July 28, 2018	138	$ 43.58	$ 6,015
April 28, 2018	140	$ 42.83	$ 6,015
January 27, 2018	103	$ 39.07	$ 4,011
October 28, 2017	51	$ 31.80	$ 1,620

There were $160 million and $180 million of stock repurchases that were pending settlement as of January 26, 2019 and July 28, 2018, respectively.
The purchase price for the shares of our stock repurchased is reflected as a reduction to shareholders' equity. We are required to allocate the purchase price of the repurchased shares as (i) a reduction to retained earnings and (ii) a reduction of common stock and additional paid-in capital.
(c) Preferred Stock
Under the terms of our Articles of Incorporation, the Board of Directors may determine the rights, preferences, and terms of our authorized but unissued shares of preferred stock.

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15. Employee Benefit Plans
(a) Employee Stock Incentive Plans
Stock Incentive Plan Program Description As of January 26, 2019, we had one stock incentive plan: the 2005 Stock Incentive Plan (the "2005 Plan"). In addition, we have, in connection with our acquisitions of various companies, assumed the share-based awards granted under stock incentive plans of the acquired companies or issued share-based awards in replacement thereof. Share-based awards are designed to reward employees for their long-term contributions to us and provide incentives for them to remain with Cisco. The number and frequency of share-based awards are based on competitive practices, operating results of Cisco, government regulations, and other factors. Our primary stock incentive plan is summarized as follows:
2005 Plan As of January 26, 2019, the maximum number of shares issuable under the 2005 Plan over its term was 694 million shares, plus shares from certain previous plans that are forfeited or are terminated for any other reason before being exercised or settled. If any awards granted under the 2005 Plan are forfeited or are terminated for any other reason before being exercised or settled, the unexercised or unsettled shares underlying the awards will again be available under the 2005 Plan. In addition, starting November 19, 2013, shares withheld by Cisco from an award other than a stock option or stock appreciation right to satisfy withholding tax liabilities resulting from such award will again be available for issuance, based on the fungible share ratio in effect on the date of grant.
Pursuant to an amendment approved by our shareholders on November 12, 2009, the number of shares available for issuance under the 2005 Plan is reduced by 1.5 shares for each share awarded as a stock grant or a stock unit, and any shares underlying awards outstanding from certain previous plans that expire unexercised at the end of their maximum terms become available for reissuance under the 2005 Plan. The 2005 Plan permits the granting of stock options, restricted stock, and restricted stock units ("RSUs"), the vesting of which may be performance-based or market-based along with the requisite service requirement, and stock appreciation rights to employees (including employee directors and officers), consultants of Cisco and its subsidiaries and affiliates, and non-employee directors of Cisco. Stock options and stock appreciation rights granted under the 2005 Plan have an exercise price of at least 100% of the fair market value of the underlying stock on the grant date. The expiration date for stock options and stock appreciation rights shall be no later than 10 years from the grant date.
The stock options will generally become exercisable for 20% or 25% of the option shares one year from the date of grant and then ratably over the following 48 months or 36 months, respectively. Time-based stock grants and time-based RSUs will generally vest over a four year term. The majority of the performance-based and market-based RSUs vests at the end of the three-year requisite service period or earlier if the award recipient meets certain retirement eligibility conditions. Certain performance-based RSUs, that are based on the achievement of financial and/or non-financial operating goals, typically vest upon the achievement of milestones (and may require subsequent service periods), with overall vesting of the shares underlying the award ranging from six months to three years. The Compensation and Management Development Committee of our Board of Directors has the discretion to use different vesting schedules. Stock appreciation rights may be awarded in combination with stock options or stock grants, and such awards shall provide that the stock appreciation rights will not be exercisable unless the related stock options or stock grants are forfeited. Stock grants may be awarded in combination with non-statutory stock options, and such awards may provide that the stock grants will be forfeited in the event that the related non-statutory stock options are exercised.
(b) Employee Stock Purchase Plan
We have an Employee Stock Purchase Plan, which includes its subplan named the International Employee Stock Purchase Plan (together, the "Purchase Plan"), under which 721 million shares of our common stock have been reserved for issuance as of January 26, 2019. Eligible employees are offered shares through a 24-month offering period, which consists of four consecutive 6-month purchase periods. Employees may purchase a limited number of shares of our stock at a discount of up to 15% of the lesser of the market value at the beginning of the offering period or the end of

each 6-month purchase period. The Purchase Plan is scheduled to terminate on the earlier of (i) January 3, 2030 and (ii) the date on which all shares available for issuance under the Purchase Plan are sold pursuant to exercised purchase rights. Under the Purchase Plan, we issued 9 million shares during the second quarter and first six months of fiscal 2019 and 12 million shares during the second quarter and first six months of fiscal 2018. As of January 26, 2019, 169 million shares were available for issuance under the Purchase Plan.

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(c) Summary of Share-Based Compensation Expense

Share-based compensation expense consists primarily of expenses for stock options, stock purchase rights, restricted stock, and RSUs granted to employees. The following table summarizes share-based compensation expense (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Cost of sales—product	$22	$ 23	$45	$ 46
Cost of sales—service	31	31	64	65
Share-based compensation expense in cost of sales	53	54	109	111
Research and development	133	134	263	270
Sales and marketing	125	135	262	270
General and administrative	65	64	127	128
Restructuring and other charges	19	12	42	18
Share-based compensation expense in operating expenses	342	345	694	686
Total share-based compensation expense	$395	$ 399	$803	$ 797
Income tax benefit for share-based compensation	$126	$ 96	$291	$ 271

As of January 26, 2019, the total compensation cost related to unvested share-based awards not yet recognized was $3.2 billion which is expected to be recognized over approximately 2.7 years on a weighted-average basis.

(d) Share-Based Awards Available for Grant

A summary of share-based awards available for grant is as follows (in millions):

	Share-Based Awards Available for Grant
BALANCE AT JULY 29, 2017	272
Restricted stock, stock units, and other share-based awards granted	(70)
Share-based awards canceled/forfeited/expired	18
Shares withheld for taxes and not issued	25
BALANCE AT JULY 28, 2018	245
Restricted stock, stock units, and other share-based awards granted	(37)
Share-based awards canceled/forfeited/expired	12
Shares withheld for taxes and not issued	15
Other	1
BALANCE AT JANUARY 26, 2019	236

For each share awarded as restricted stock or a restricted stock unit award under the 2005 Plan, 1.5 shares was deducted from the available share-based award balance. For restricted stock units that were awarded with vesting contingent upon the achievement of future financial performance or market-based metrics, the maximum awards that can be achieved upon full vesting of such awards were reflected in the preceding table.

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(e) Restricted Stock and Stock Unit Awards

A summary of the restricted stock and stock unit activity, which includes time-based and performance-based or market-based RSUs, is as follows (in millions, except per-share amounts):

	Restricted Stock/ Stock Units	Weighted-Average Grant Date Fair Value per Share	Aggregate Fair Value
UNVESTED BALANCE AT JULY 29, 2017	141	$ 26.94	
Granted	46	35.62	
Assumed from acquisitions	1	28.26	
Vested	(53)	26.02	$ 1,909
Canceled/forfeited/other	(16)	28.37	
UNVESTED BALANCE AT JULY 28, 2018	119	30.56	
Granted	25	44.69	
Vested	(31)	27.99	$ 1,453
Canceled/forfeited/other	(10)	31.20	
UNVESTED BALANCE AT JANUARY 26, 2019	103	$ 34.66	

(f) Stock Option Awards

A summary of the stock option activity is as follows (in millions, except per-share amounts):

	STOCK OPTIONS OUTSTANDING	
	Number Outstanding	Weighted-Average Exercise Price per Share
BALANCE AT JULY 29, 2017	12	$ 6.15
Assumed from acquisitions	3	8.20
Exercised	(8)	5.77
Canceled/forfeited/expired	(1)	8.75
BALANCE AT JULY 28, 2018	6	7.18
Exercised	(2)	6.79
BALANCE AT JANUARY 26, 2019	4	$ 7.27

The following table summarizes significant ranges of outstanding and exercisable stock options as of January 26, 2019 (in millions, except years and share prices):

	STOCK OPTIONS OUTSTANDING				STOCK OPTIONS EXERCISABLE		
Range of Exercise Prices	Number Outstanding	Weighted-Average Remaining Contractual Life (in Years)	Weighted-Average Exercise Price per Share	Aggregate Intrinsic Value	Number Exercisable	Weighted-Average Exercise Price per Share	Aggregate Intrinsic Value
$ 0.01 – 35.00	4	5.3	$ 7.27	$ 167	3	$ 7.11	$ 130

The aggregate intrinsic value in the preceding table represents the total pretax intrinsic value, based on our closing stock price of $46.13 as of January 25, 2019. The total number of in-the-money stock options exercisable as of January 26, 2019 was 3 million. As of July 28, 2018, 4 million outstanding stock options were exercisable and the weighted-average exercise price was $6.84.

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(Unaudited)

(g) Valuation of Employee Share-Based Awards

Time-based restricted stock units and performance-based restricted stock units ("PRSUs") that are based on our financial performance metrics or non-financial operating goals are valued using the market value of our common stock on the date of grant, discounted for the present value of expected dividends. On the date of grant, we estimated the fair value of the total shareholder return ("TSR") component of the PRSUs using a Monte Carlo simulation model. The assumptions for the valuation of time-based RSUs and PRSUs are summarized as follows:

	RESTRICTED STOCK UNITS		PERFORMANCE BASED RESTRICTED STOCK UNITS	
Three Months Ended	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Number of shares granted (in millions)	17	21	—	—
Grant date fair value per share	$44.53	$ 34.89	N/A	$ 32.47
Weighted-average assumptions/inputs:				
Expected dividend yield	2.8 %	3.1 %	N/A	3.2 %
Range of risk-free interest rates	0.0% – 2.8%	0.0% – 2.1%	N/A	1.0%-1.8%
Range of expected volatilities for index	N/A	N/A	N/A	13.2%-81.0%

	RESTRICTED STOCK UNITS		PERFORMANCE BASED RESTRICTED STOCK UNITS	
Six Months Ended	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Number of shares granted (in millions)	23	28	2	3
Grant date fair value per share	$44.48	$ 33.50	$47.00	$ 31.31
Weighted-average assumptions/inputs:				
Expected dividend yield	2.8 %	3.2 %	2.8 %	3.6 %
Range of risk-free interest rates	0.0% – 2.9%	0.0% – 2.1%	2.1% – 3.0%	1.0%-1.8%
Range of expected volatilities for index	N/A	N/A	13.0% – 65.2%	13.2%-81.0%

The PRSUs granted during the periods presented are contingent on the achievement of our financial performance metrics, our comparative market-based returns, or the achievement of financial and non-financial operating goals. For the awards based on financial performance metrics or comparative market-based returns, generally 50% of the PRSUs are earned based on the average of annual operating cash flow and earnings per share goals established at the beginning of each fiscal year over a three-year performance period. Generally, the remaining 50% of the PRSUs are earned based on our TSR measured against the benchmark TSR of a peer group over the same period. Each PRSU recipient could vest in 0% to 150% of the target shares granted contingent on the achievement of our financial performance metrics or our comparative market-based returns and 0% to 100% of the target shares granted contingent on the achievement of non-financial operating goals.

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16. Comprehensive Income (Loss)

The components of AOCI, net of tax, and the other comprehensive income (loss), excluding noncontrolling interest, for the first six months of fiscal 2019 and fiscal 2018 are summarized as follows (in millions):

	Net Unrealized Gains (Losses) on Available-for-Sale Investments	Net Unrealized Gains (Losses) Cash Flow Hedging Instruments	Cumulative Translation Adjustment and Actuarial Gains (Losses)	Accumulated Other Comprehensive Income (Loss)
BALANCE AT JULY 28, 2018	$ (310)	$ (11)	$ (528)	$ (849)
Other comprehensive income (loss) before reclassifications attributable to Cisco Systems, Inc.	86	(9)	(184)	(107)
(Gains) losses reclassified out of AOCI	11	(1)	3	13
Tax benefit (expense)	—	2	(1)	1
Total change for the period	97	(8)	(182)	(93)
Effect of adoption of accounting standards	(168)	—	—	(168)
BALANCE AT JANUARY 26, 2019	$ (381)	$ (19)	$ (710)	$ (1,110)

	Net Unrealized Gains (Losses) on Available-for-Sale Investments	Net Unrealized Gains (Losses) Cash Flow Hedging Instruments	Cumulative Translation Adjustment and Actuarial Gains (Losses)	Accumulated Other Comprehensive Income (Loss)
BALANCE AT JULY 29, 2017	$ 373	$ 32	$ (359)	$ 46
Other comprehensive income (loss) before reclassifications attributable to Cisco Systems, Inc.	(174)	38	292	156
(Gains) losses reclassified out of AOCI	(91)	(31)	5	(117)
Tax benefit (expense)	3	1	(6)	(2)
Total change for the period	(262)	8	291	37
BALANCE AT JANUARY 27, 2018	$ 111	$ 40	$ (68)	$ 83

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The net gains (losses) reclassified out of AOCI into the Consolidated Statements of Operations, with line item location, during each period were as follows (in millions):

	Three Months Ended		Six Months Ended		
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018	
Comprehensive Income Components	Income Before Taxes		Income Before Taxes		Line Item in Statements of Operations
Net unrealized gains and losses on available-for-sale investments	$(5)	$ 58	$(11)	$ 91	Other income (loss), net
Net unrealized gains and losses on cash flow hedging instruments					
Foreign currency derivatives	1	—	1	—	Revenue—product
Foreign currency derivatives	1	—	2	—	Revenue—service
Foreign currency derivatives	(1)	4	(1)	7	Cost of sales—service
Foreign currency derivatives	—	14	(1)	24	Operating expenses
	1	18	1	31	
Cumulative translation adjustment and actuarial gains and losses	—	(4)	—	(5)	Operating expenses
Cumulative translation adjustment and actuarial gains and losses	(4)	—	(3)	—	Other income (loss), net
Total amounts reclassified out of AOCI	$(8)	$ 72	$(13)	$ 117	

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CISCO SYSTEMS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)
(Unaudited)

17. Income Taxes

The following table provides details of income taxes (in millions, except percentages):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Income before provision for income taxes	$3,343	$3,232	$7,252	$6,194
Provision for income taxes	$521	$12,010	$881	$12,578
Effective tax rate	15.6 %	371.6 %	12.1 %	203.1 %

The effective tax rate for the first six months of fiscal 2019 includes a $152 million tax benefit relating to indirect effects from adoption of ASC 606 at the beginning of fiscal 2019.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted. The Tax Act significantly revises the U.S. corporate income tax by, among other things, lowering the statutory corporate income tax rate (“federal tax rate”) from 35% to 21% effective January 1, 2018, implementing a modified territorial tax system, and imposing a mandatory one-time transition tax on accumulated earnings of foreign subsidiaries. The enactment of the Tax Act resulted in us recording a provisional tax expense of $10.4 billion in fiscal 2018. In the second quarter of fiscal 2019, we completed our accounting relating to the Tax Act and recorded an additional $58 million of tax expense. The total tax charge as a result of the Tax Act was $10.5 billion, consisting of $8.2 billion of tax expense for the U.S. transition tax on accumulated earnings of foreign subsidiaries, $1.2 billion of foreign withholding tax and $1.1 billion of tax expense for DTA re-measurement. The tax expense related to the U.S. transition tax on accumulated earnings in foreign subsidiaries is net of a $0.9 billion benefit related to U.S. taxation of deemed foreign dividends in the transition fiscal year. This benefit may be reduced or eliminated in future legislation. If such legislation is enacted, we will record the impact of the legislation in the quarter of enactment.

The Tax Act includes a Global Intangible Low-Taxed Income ("GILTI") provision that imposes U.S. tax on certain foreign subsidiary income in the year it is earned. Our accounting policy is to treat tax on GILTI as a current period cost included in tax expense in the year incurred.

As of January 26, 2019, we had $1.8 billion of unrecognized tax benefit, of which $1.6 billion, if recognized, would favorably impact the effective tax rate. We regularly engage in discussions and negotiations with tax authorities regarding tax matters in various jurisdictions. We believe it is reasonably possible that certain federal, foreign and state tax matters may be concluded in the next 12 months. Specific positions that may be resolved include issues involving transfer pricing and various other matters. We estimate that the unrecognized tax benefits at January 26, 2019 could be reduced by approximately $50 million in the next 12 months.

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CISCO SYSTEMS, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)
(Unaudited)

18. Segment Information and Major Customers

(a) Revenue and Gross Margin by Segment

We conduct business globally and are primarily managed on a geographic basis consisting of three segments: the Americas, EMEA, and APJC. Our management makes financial decisions and allocates resources based on the information it receives from our internal management system. Sales are attributed to a segment based on the ordering location of the customer. We do not allocate research and development, sales and marketing, or general and administrative expenses to our segments in this internal management system because management does not include the information in our measurement of the performance of the operating segments. In addition, we do not allocate amortization and impairment of acquisition-related intangible assets, share-based compensation expense, significant litigation settlements and other contingencies, charges related to asset impairments and restructurings, and certain other charges to the gross margin for each segment because management does not include this information in our measurement of the performance of the operating segments.

Summarized financial information by segment for the second quarter and the first six months of fiscal 2019 and fiscal 2018, based on our internal management system and as utilized by our Chief Operating Decision Maker ("CODM"), is as follows (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Revenue:				
Americas	$7,352	$ 7,004	$15,103	$ 14,354
EMEA	3,223	3,062	6,447	5,971
APJC	1,872	1,820	3,968	3,698
Total	$12,446	$ 11,887	$25,518	$ 24,023
Gross margin:				
Americas	$4,796	$ 4,614	$9,866	$ 9,336
EMEA	2,070	1,977	4,141	3,816
APJC	1,109	1,094	2,309	2,259
Segment total	7,975	7,685	16,316	15,411
Unallocated corporate items	(202)	(187)	(397)	(486)
Total	$7,773	$ 7,498	$15,919	$ 14,925

Amounts may not sum and percentages may not recalculate due to rounding.

Revenue in the United States was $6.4 billion and $6.1 billion for the second quarter of fiscal 2019 and fiscal 2018, respectively, and $13.3 billion and $12.6 billion for the first six months of fiscal 2019 and fiscal 2018, respectively.

(b) Revenue for Groups of Similar Products and Services

We design, manufacture, and sell Internet Protocol (IP)-based networking and other products related to the communications and information technology (IT) industry and provide services associated with these products and their use.

The following table presents revenue for groups of similar products and services (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Revenue:				
Infrastructure Platforms	$7,128	$ 6,710	$14,770	$ 13,690
Applications	1,465	1,184	2,884	2,387
Security	658	557	1,308	1,142
Other Products	22	258	200	544
Total Product	9,273	8,709	19,163	17,763
Services	3,173	3,178	6,355	6,260
Total [(1)]	$12,446	$ 11,887	$25,518	$ 24,023

[(1)] Includes SPVSS business revenue of $0 and $230 million for the second quarter of fiscal 2019 and 2018, respectively, and $168 million and $478 million for the first six months of fiscal 2019 and fiscal 2018, respectively.

(c) Additional Segment Information

The majority of our assets was attributable to our U.S. operations as of each of January 26, 2019 and July 28, 2018. Property and equipment information is based on the physical location of the assets. The following table presents property and equipment information for geographic areas (in millions):

	January 26, 2019	July 28, 2018
Property and equipment, net:		
United States	$ 2,394	$ 2,487
International	537	519
Total	$ 2,931	$ 3,006

19. Net Income (Loss) per Share

The following table presents the calculation of basic and diluted net income (loss) per share (in millions, except per-share amounts):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Net income (loss)	$2,822	$ (8,778)	$6,371	$ (6,384)
Weighted-average shares—basic	4,470	4,924	4,517	4,942
Effect of dilutive potential common shares	35	—	40	—
Weighted-average shares—diluted	4,505	4,924	4,557	4,942
Net income (loss) per share—basic	$0.63	$ (1.78)	$1.41	$ (1.29)
Net income (loss) per share—diluted	$0.63	$ (1.78)	$1.40	$ (1.29)

Employee equity share options, unvested shares, and similar equity instruments granted and assumed by Cisco are treated as potential common shares outstanding in computing diluted earnings per share. Diluted shares outstanding include the dilutive effect of in-the-money options, unvested restricted stock, and restricted stock units. The dilutive effect of such equity awards is calculated based on the average share price for each fiscal period using the treasury stock method. Under the treasury stock method, the amount the employee must pay for exercising stock options and the amount of compensation cost for future service that has not yet recognized are collectively assumed to be used to repurchase shares.

We excluded antidilutive employee-share based awards of 27 million and 28 million for the second quarter and first six months of fiscal 2019, respectively. For the second quarter and first six months of fiscal 2018, we excluded the impact of potentially dilutive common shares from the calculation of net income (loss) per share as the inclusion would have an antidilutive effect.

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Item 2. Management’s Discussion and Analysis of Financial Condition and Results of Operations

Forward-Looking Statements

This Quarterly Report on Form 10-Q, including this Management’s Discussion and Analysis of Financial Condition and Results of Operations, contains forward-looking statements regarding future events and our future results that are subject to the safe harbors created under the Securities Act of 1933 (the “Securities Act”) and the Securities Exchange Act of 1934 (the “Exchange Act”). All statements other than statements of historical facts are statements that could be deemed forward-looking statements. These statements are based on current expectations, estimates, forecasts, and projections about the industries in which we operate and the beliefs and assumptions of our management. Words such as “expects,” “anticipates,” “targets,” “goals,” “projects,” “intends,” “plans,” “believes,” "momentum," “seeks,” “estimates,” “c “endeavors,” “strives,” “may,” variations of such words, and similar expressions are intended to identify such forward-looking statements. In addition, any statements that refer to projections of our future financial performance, our anticipated growth and trends in our businesses, and other characterizations of future events or circumstances are forward-looking statements. Readers are cautioned that these forward-looking statements are only predictions and are subject to risks, uncertainties, and assumptions that are difficult to predict, including those under “Part II, Item 1A. Risk Factors,” and elsewhere herein. Therefore, actual results may differ materially and adversely from those expressed in any forward-looking statements. We undertake no obligation to revise or update any forward-looking statements for any reason.

OVERVIEW

Cisco designs and sells a broad range of technologies that have been powering the Internet since 1984. Across networking, security, collaboration, applications and the cloud, our evolving intent-based technologies are constantly learning and adapting to provide customers with a highly secure, intelligent platform for their digital business. A summary of our results is as follows (in millions, except percentages and per-share amounts):

	Three Months Ended			Six Months Ended		
	January 26, 2019	January 27, 2018	% Variance	January 26, 2019	January 27, 2018	% Variance
Revenue [1]	$12,446	$11,887	5 %	$25,518	$24,023	6 %
Gross margin percentage	62.5 %	63.1 %	(0.6) pts	62.4 %	62.1 %	0.3 pts
Research and development	$1,557	$1,549	1 %	$3,165	$3,116	2 %
Sales and marketing	$2,271	$2,235	2 %	$4,681	$4,569	2 %
General and administrative	$509	$483	5 %	$720	$1,040	(31)%
Total research and development, sales and marketing, general and administrative	$4,337	$4,267	2 %	$8,566	$8,725	(2)%
Total as a percentage of revenue	34.8 %	35.9 %	(1.1) pts	33.6 %	36.3 %	(2.7) pts
Amortization of purchased intangible assets included in operating expenses	$39	$60	(35)%	$73	$121	(40)%
Restructuring and other charges included in operating expenses	$186	$98	90 %	$264	$250	6 %
Interest and other income (loss), net	$132	$159	(17)%	$236	$365	(35)%
Operating income as a percentage of revenue	25.8 %	25.9 %	(0.1) pts	27.5 %	24.3 %	3.2 pts
Income tax percentage	15.6 %	371.6 %	NM	12.1 %	203.1 %	NM
Net income (loss) [2]	$2,822	$(8,778)	NM	$6,371	$(6,384)	NM
Net income (loss) as a percentage of revenue [2]	22.7 %	(73.8)%	NM	25.0 %	(26.6)%	NM
Earnings (loss) per share—diluted [2]	$0.63	$(1.78)	NM	$1.40	$(1.29)	NM

NM - Not meaningful; we recognized a net loss for the second quarter and first six months of fiscal 2018 related to the enactment of the Tax Cuts and Jobs Act.

We adopted ASC 606 in the first quarter of fiscal 2019 using the modified retrospective method. See Note 2 to the Consolidated Financial Statements for impact of this adoption on our operating results for the second quarter and first six months of fiscal 2019.

(1) During the second quarter of fiscal 2019, we completed the sale of our Service Provider Video Software Solutions ("SPVSS") business. As a result, revenue from this business will not recur in future periods. Includes SPVSS business revenue of $0 and $230 million for the second quarter of fiscal 2019 and 2018, respectively, and $168 million and $478 million for the first six months of fiscal 2019 and 2018, respectively.

(2) Second quarter and first six months of fiscal 2018 results include an $11.1 billion charge related to the enactment of the Tax Cuts and Jobs Act.

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Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

In the second quarter of fiscal 2019, we delivered revenue growth across all geographies and product areas, solid margins and operating cash flow. We remain focused on accelerating innovation across our portfolio, and we believe that we have made continued progress on our strategic priorities. Our product revenue reflected growth in Infrastructure Platforms, Applications and Security, and we continued to make progress in the transition of our business model to increased software and subscriptions. Notwithstanding the second quarter fiscal 2019 results, we continue to operate in a challenging and highly competitive environment. While the overall environment remains uncertain, we continue to aggressively invest in priority areas with the objective of driving profitable growth over the long term.

Total revenue increased by 5% compared with the second quarter of fiscal 2018. Within total revenue, product revenue increased by 6% and service revenue was flat. In the second quarter of fiscal 2019, on October 28, 2018, we completed the sale of our SPVSS business. Total revenue for the second quarter of fiscal 2019 increased 7% not including revenue from SPVSS business in the prior year period. Total gross margin decreased by 0.6 percentage points, driven by unfavorable impacts from pricing and productivity. As a percentage of revenue, research and development, sales and marketing, and general and administrative expenses, collectively, decreased by 1.1 percentage points. Operating income as a percentage of revenue decreased by 0.1 percentage points. The net loss and net loss per share in the prior year period were driven by the one-time transition tax on accumulated earnings of foreign subsidiaries, foreign withholding taxes, and re-measurement of net deferred tax assets and liabilities recorded during the second quarter of fiscal 2018.

In terms of our geographic segments, revenue from the Americas increased $348 million, EMEA revenue increased by $161 million, and revenue in our APJC segment increased by $52 million. These increases reflect broad strength across several countries within these segments. The "BRICM" countries experienced product revenue growth of 5% in the aggregate, driven by increased product revenue in the emerging countries of Mexico, India, Brazil and Russia of 35%, 18%, 14% and 4%, respectively, partially offset by a product revenue decrease of 16% in China.

From a customer market standpoint, we experienced product revenue growth in the public sector, enterprise and commercial markets, partially offset by a product revenue decline in the service provider market.

From a product category perspective, total product revenue, not including SPVSS products in the prior year period, increased 9% year over year. The increase was driven by a 6% product revenue increase in Infrastructure Platforms and solid product revenue growth in Applications and Security, which grew by 24% and 18% respectively.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

Total revenue increased 6%, with product revenue increasing 8% and service revenue increasing 2%. Total gross margin increased by 0.3 percentage points due to productivity benefits and a $127 million legal and indemnification settlement charge recorded in the first six months of fiscal 2018, partially offset by unfavorable impacts from pricing. As a percentage of revenue, research and development, sales and marketing, and general and administrative expenses collectively decreased by 2.7 percentage points due to lower general and administrative expenses. General and administrative expenses decreased due to a benefit from the $400 million litigation settlement with Arista in the first quarter of fiscal 2019. Operating income as a percentage of revenue increased by 3.2 percentage points. The net loss and net loss per share in the prior year period were driven by similar factors as discussed in the three-month period immediately above.

Strategy and Priorities

As our customers add billions of new connections to their enterprises, and as more applications move to a multi-cloud environment, we believe the network continues to be extremely critical. We believe that our customers are looking for intent-based networks that provide meaningful business value through automation, security, and analytics across private, hybrid, and multi-cloud environments. Our vision is to deliver highly secure, software-defined, automated and intelligent platforms for our customers. Our strategic priorities include the following: accelerating our pace of innovation, increasing the value of the network, and transforming our business model.

For additional discussion of our strategy and priorities, see Item 1. Business in our Annual Report on Form 10-K for the year ended July 28, 2018.

Other Key Financial Measures

The following is a summary of our other key financial measures for the second quarter and first six months of fiscal 2019 (in millions):

	January 26, 2019	July 28, 2018
Cash and cash equivalents and investments	$ 40,383	$46,548
Deferred revenue	$ 17,261	$19,685
Inventories	$ 1,701	$1,846

	Six Months Ended	
	January 26, 2019	January 27, 2018
Cash provided by operating activities	$7,560	$ 7,150
Repurchases of common stock—stock repurchase program	$10,042	$ 5,631
Dividends	$2,970	$ 2,861

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CISCO SYSTEMS, INC.
MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

CRITICAL ACCOUNTING ESTIMATES

The preparation of financial statements and related disclosures in conformity with accounting principles generally accepted in the United States requires us to make judgments, assumptions, and estimates that affect the amounts reported in the Consolidated Financial Statements and accompanying notes. Note 2 to the Consolidated Financial Statements in our Annual Report on Form 10-K for the year ended July 28, 2018, as updated as applicable in Note 2 to the Consolidated Financial Statements herein, describes the significant accounting policies and methods used in the preparation of the Consolidated Financial Statements. The accounting policies described below are significantly affected by critical accounting estimates. Such accounting policies require significant judgments, assumptions, and estimates used in the preparation of the Consolidated Financial Statements, and actual results could differ materially from the amounts reported based on these policies.

Revenue Recognition

In May 2014, the FASB issued ASC 606, Revenue from Contracts with Customers, a new accounting standard related to revenue recognition. ASC 606 supersedes nearly all U.S. GAAP on revenue recognition and eliminated industry-specific guidance. The underlying principle of ASC 606 is to recognize revenue when a customer obtains control of promised goods or services at an amount that reflects the consideration that is expected to be received in exchange for those goods or services.

ASC 606 allowed two methods of adoption: i) retrospectively to each prior period presented ("full retrospective method"), or ii) retrospectively with the cumulative effect recognized in retained earnings as of the date of adoption ("modified retrospective method"). At the beginning of our first quarter of fiscal 2019, we adopted ASC 606 using the modified retrospective method to those contracts that were not completed as of July 28, 2018.

ASC 606 primarily impacted our revenue recognition for software arrangements and sales to two-tier distributors. In both areas, the new standard accelerates the recognition of revenue.

We enter into contracts with customers that can include various combinations of products and services which are generally distinct and accounted for as separate performance obligations. As a result, our contracts may contain multiple performance obligations. We determine whether arrangements are distinct based on whether the customer can benefit from the product or service on its own or together with other resources that are readily available and whether our commitment to transfer the product or service to the customer is separately identifiable from other obligations in the contract. We classify our hardware, perpetual software licenses, and SaaS as distinct performance obligations. Term software licenses represent multiple obligations, which include software licenses and software maintenance. In transactions where we deliver hardware or software, we are typically the principal and we record revenue and costs of goods sold on a gross basis.

We recognize revenue upon transfer of control of promised goods or services in a contract with a customer in an amount that reflects the consideration we expect to receive in exchange for those products or services. Transfer of control occurs once the customer has the contractual right to use the product, generally upon shipment or once delivery and risk of loss has transferred to the customer. Transfer of control can also occur over time for software maintenance and services as the customer receives the benefit over the contract term. Our hardware and perpetual software licenses are distinct performance obligations where revenue is recognized upfront upon transfer of control. Term software licenses include multiple performance obligations where the term licenses are recognized upfront upon transfer of control, with the associated software maintenance revenue recognized ratably over the contract term as services and software updates are provided. SaaS arrangements have one distinct performance obligation which is satisfied over time with revenue recognized ratably over the contract term as the customer consumes the services. On our product sales, we record consideration from shipping and handling on a gross basis within net product sales. We record our revenue net of any associated sales taxes.

Revenue is allocated among these performance obligations in a manner that reflects the consideration that we expect to be entitled to for the promised goods or services based on standalone selling prices (SSP). SSP is estimated for each distinct performance obligation and judgment may be required in their determination. The best evidence of SSP is the observable price of a product or service when we sell the goods separately in similar circumstances and to similar customers. In instances where SSP is not directly observable, we determine SSP using information that may include market conditions and other observable inputs.

We apply judgment in determining the transaction price as we may be required to estimate variable consideration when determining the amount of revenue to recognize. Variable consideration includes various rebate, cooperative marketing, and other incentive programs that we offer to our distributors, partners and customers. When determining the amount of revenue to recognize, we estimate the expected usage of these programs, applying the expected value or most likely estimate and update the estimate at each reporting period as actual utilization becomes available. We also consider the customers' right of return in determining the transaction price, where applicable. If actual credits received by distributors under these programs were to deviate significantly from our estimates, which are based on historical experience, our revenue could be adversely affected.

See Notes 2 and 3 to the Consolidated Financial Statements for more details.

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CISCO SYSTEMS, INC.
MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

Allowances for Receivables and Sales Returns

The allowances for receivables were as follows (in millions, except percentages):

	January 26, 2019	July 28, 2018
Allowance for doubtful accounts	$ 135	$ 129
Percentage of gross accounts receivable	3.5 %	2.3 %
Allowance for credit loss—lease receivables	$ 127	$ 135
Percentage of gross lease receivables(1)	4.8 %	4.7 %
Allowance for credit loss—loan receivables	$ 64	$ 60
Percentage of gross loan receivables	1.3 %	1.2 %

(1) Calculated as allowance for credit loss on lease receivables as a percentage of gross lease receivables and residual value before unearned income.

The allowance for doubtful accounts is based on our assessment of the collectibility of customer accounts. We regularly review the adequacy of these allowances by considering internal factors such as historical experience, credit quality and age of the receivable balances as well as external factors such as economic conditions that may affect a customer's ability to pay as well as historical and expected default frequency rates, which are published by major third-party credit-rating agencies and are updated on a quarterly basis. We also consider the concentration of receivables outstanding with a particular customer in assessing the adequacy of our allowances for doubtful accounts. If a major customer's creditworthiness deteriorates, if actual defaults are higher than our historical experience, or if other circumstances arise, our estimates of the recoverability of amounts due to us could be overstated, and additional allowances could be required, which could have an adverse impact on our operating results.

The allowance for credit loss on financing receivables is also based on the assessment of collectibility of customer accounts. We regularly review the adequacy of the credit allowances determined either on an individual or a collective basis. When evaluating the financing receivables on an individual basis, we consider historical experience, credit quality and age of receivable balances, and economic conditions that may affect a customer's ability to pay. When evaluating financing receivables on a collective basis, we use expected default frequency rates published by a major third-party credit-rating agency as well as our own historical loss rate in the event of default, while also systematically giving effect to economic conditions, concentration of risk and correlation. Determining expected default frequency rates and loss factors associated with internal credit risk ratings, as well as assessing factors such as economic conditions, concentration of risk, and correlation, are complex and subjective. Our ongoing consideration of all these factors could result in an increase in our allowance for credit loss in the future, which could adversely affect our operating results. Both accounts receivable and financing receivables are charged off at the point when they are considered uncollectible.

A reserve for future sales returns is established based on historical trends in product return rates. The reserve for future sales returns as of January 26, 2019 and July 28, 2018 was $92 million and $123 million, respectively, and was recorded as a reduction of our accounts receivable and revenue. If the actual future returns were to deviate from the historical data on which the reserve had been established, our revenue could be adversely affected.

Inventory Valuation and Liability for Purchase Commitments with Contract Manufacturers and Suppliers

Inventory is written down based on excess and obsolete inventories, determined primarily by future demand forecasts. Inventory write-downs are measured as the difference between the cost of the inventory and market, based upon assumptions about future demand, and are charged to the provision for inventory, which is a component of our cost of sales. At the point of the loss recognition, a new, lower cost basis for that inventory is established, and subsequent changes in facts and circumstances do not result in the restoration or increase in that newly established cost basis.

We record a liability for firm, noncancelable, and unconditional purchase commitments with contract manufacturers and suppliers for quantities in excess of our future demand forecasts consistent with the valuation of our excess and obsolete inventory.

Our provision for inventory was $23 million and $31 million for the first six months of fiscal 2019 and 2018, respectively. The provision for the liability related to purchase commitments with contract manufacturers and suppliers was $48 million and $44 million for the first six months of fiscal 2019 and 2018, respectively. If there were to be a sudden and significant decrease in demand for our products, or if there were a higher incidence of inventory obsolescence because of rapidly changing technology and customer requirements, we could be required to increase our inventory write-downs, and our liability for purchase commitments with contract manufacturers and suppliers, and accordingly our profitability, could be adversely affected. We regularly evaluate our exposure for inventory write-downs and the adequacy of our liability for purchase commitments.

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Loss Contingencies and Product Warranties

We are subject to the possibility of various losses arising in the ordinary course of business. We consider the likelihood of impairment of an asset or the incurrence of a liability, as well as our ability to reasonably estimate the amount of loss, in determining loss contingencies. An estimated loss contingency is accrued when it is probable that an asset has been impaired or a liability has been incurred and the amount of loss can be reasonably estimated. We regularly evaluate information available to us to determine whether such accruals should be made or adjusted and whether new accruals are required.

Third parties, including customers, have in the past and may in the future assert claims or initiate litigation related to exclusive patent, copyright, trademark, and other intellectual property rights to technologies and related standards that are relevant to us. These assertions have increased over time as a result of our growth and the general increase in the pace of patent claims assertions, particularly in the United States. If any infringement or other intellectual property claim made against us by any third party is successful, or if we fail to develop non-infringing technology or license the proprietary rights on commercially reasonable terms and conditions, our business, operating results, and financial condition could be materially and adversely affected.

Our products are generally covered by a warranty for periods ranging from 90 days to five years, and for some products we provide a limited lifetime warranty. We accrue for warranty costs as part of our cost of sales based on associated material costs, technical support labor costs, and associated overhead. Material cost is estimated based primarily upon historical trends in the volume of product returns within the warranty period and the cost to repair or replace the equipment. Technical support labor cost is estimated based primarily upon historical trends in the rate of customer cases and the cost to support the customer cases within the warranty period. Overhead cost is applied based on estimated time to support warranty activities.

If we experience an increase in warranty claims compared with our historical experience, or if the cost of servicing warranty claims is greater than expected, our profitability could be adversely affected.

Impairment of Investments

We recognize an impairment charge when the declines in the fair values of our available-for-sale debt investments below their cost basis are judged to be other than temporary. The ultimate value realized on these securities, to the extent unhedged, is subject to market price volatility until they are sold.

If the fair value of a debt security is less than its amortized cost, we assess whether the impairment is other than temporary. An impairment is considered other than temporary if (i) we have the intent to sell the security, (ii) it is more likely than not that we will be required to sell the security before recovery of its entire amortized cost basis, or (iii) we do not expect to recover the entire amortized cost of the security. If an impairment is considered other than temporary based on (i) or (ii) described in the prior sentence, the entire difference between the amortized cost and the fair value of the security is recognized in earnings. If an impairment is considered other than temporary based on condition (iii), the amount representing credit loss, defined as the difference between the present value of the cash flows expected to be collected and the amortized cost basis of the debt security, will be recognized in earnings, and the amount relating to all other factors will be recognized in other comprehensive income (OCI). In estimating the amount and timing of cash flows expected to be collected, we consider all available information, including past events, current conditions, the remaining payment terms of the security, the financial condition of the issuer, expected defaults, and the value of underlying collateral.

We hold non-marketable equity and other investments, some of which are in the startup or development stages. As of January 26, 2019, our non-marketable equity and other investments were $1.3 billion, compared with $1.1 billion as of July 28, 2018, and were included in other assets. We monitor these investments for events or circumstances indicative of potential impairment, and we make appropriate reductions in carrying values if we determine that an impairment charge is required, based primarily on the financial condition and near-term prospects of these companies. These investments are inherently risky because the markets for the technologies or products these companies are developing are typically in the early stages and may never materialize.

Goodwill and Purchased Intangible Asset Impairments

Our methodology for allocating the purchase price relating to purchase acquisitions is determined through established valuation techniques. Goodwill represents a residual value as of the acquisition date, which in most cases results in measuring goodwill as an excess of the purchase consideration transferred plus the fair value of any noncontrolling interest in the acquired company over the fair value of net assets acquired, including contingent consideration. We perform goodwill impairment tests on an annual basis in the fourth fiscal quarter and between annual tests in certain circumstances for each reporting unit. The assessment of fair value for goodwill and purchased intangible assets is based on factors that market participants would use in an orderly transaction in accordance with the new accounting guidance for the fair value measurement of nonfinancial assets.

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The goodwill recorded in the Consolidated Balance Sheets as of January 26, 2019 and July 28, 2018 was $33.3 billion and $31.7 billion, respectively. In response to changes in industry and market conditions, we could be required to strategically realign our resources and consider restructuring, disposing of, or otherwise exiting businesses, which could result in an impairment of goodwill. There was no impairment of goodwill in each of the first six months of fiscal 2019 and 2018.

The fair value of acquired technology and patents, as well as acquired technology under development, is determined at acquisition date primarily using the income approach, which discounts expected future cash flows to present value. The discount rates used in the present value calculations are typically derived from a weighted-average cost of capital analysis and then adjusted to reflect risks inherent in the development lifecycle as appropriate. We consider the pricing model for products related to these acquisitions to be standard within the high-technology communications industry, and the applicable discount rates represent the rates that market participants would use for valuation of such intangible assets.

We make judgments about the recoverability of purchased intangible assets with finite lives whenever events or changes in circumstances indicate that an impairment may exist. Recoverability of purchased intangible assets with finite lives is measured by comparing the carrying amount of the asset to the future undiscounted cash flows the asset is expected to generate. We review indefinite-lived intangible assets for impairment annually or whenever events or changes in circumstances indicate that the asset might be impaired. If the asset is considered to be impaired, the amount of any impairment is measured as the difference between the carrying value and the fair value of the impaired asset. Assumptions and estimates about future values and remaining useful lives of our purchased intangible assets are complex and subjective. They can be affected by a variety of factors, including external factors such as industry and economic trends, and internal factors such as changes in our business strategy and our internal forecasts.

There were no impairment charges related to purchased intangible assets for the first six months of fiscal 2019 and 2018. Our ongoing consideration of all the factors described previously could result in additional impairment charges in the future, which could adversely affect our net income.

Income Taxes

We are subject to income taxes in the United States and numerous foreign jurisdictions. Our effective tax rates differ from the statutory rate, primarily due to the tax impact of state taxes, foreign operations, R&D tax credits, domestic manufacturing deductions, foreign-derived intangible income deductions, global intangible low-taxed income, tax audit settlements, nondeductible compensation, international realignments, and transfer pricing adjustments. Our effective tax rate was 15.6% and 371.6% in the second quarter of fiscal 2019 and 2018, respectively. Our effective tax rate was 12.1% and 203.1% in the first six months of fiscal 2019 and 2018, respectively.

On December 22, 2017, the Tax Cuts and Jobs Act (the "Tax Act") was enacted. The Tax Act significantly revises the U.S. corporate income tax by, among other things, lowering the statutory corporate income tax rate ("federal tax rate") from 35% to 21% effective January 1, 2018, implementing a modified territorial tax system, and imposing a mandatory one-time transition tax on accumulated earnings of foreign subsidiaries. As a result of the Tax Act enactment, we recorded a provisional tax expense of $10.4 billion in fiscal 2018. In the second quarter of fiscal 2019, we completed our accounting relating to the Tax Act and recorded an additional $58 million tax expense. The total tax charge as the result of the Tax Act is $10.5 billion, consisting of $8.2 billion of tax expense for the U.S. transition tax on accumulated earnings of foreign subsidiaries, $1.2 billion of foreign withholding tax, and $1.1 billion of tax expense for DTA re-measurement. The tax expense related to the U.S. transition tax on accumulated earnings in foreign subsidiaries is net of a $0.9 billion benefit related to U.S. taxation of deemed foreign dividends in the transition fiscal year. This benefit may be reduced or eliminated in future legislation. If such legislation is enacted, we will record the impact of the legislation in the quarter of enactment.

Significant judgment is required in evaluating our uncertain tax positions and determining our provision for income taxes. Although we believe our reserves are reasonable, no assurance can be given that the final tax outcome of these matters will not be different from that which is reflected in our historical income tax provisions and accruals. We adjust these reserves in light of changing facts and circumstances, such as the closing of a tax audit or the refinement of an estimate. To the extent that the final tax outcome of these matters is different than the amounts recorded, such differences will impact the provision for income taxes in the period in which such determination is made. The provision for income taxes includes the impact of reserve provisions and changes to reserves that are considered appropriate, as well as the related net interest and penalties.

Significant judgment is also required in determining any valuation allowance recorded against deferred tax assets. In assessing the need for a valuation allowance, we consider all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that we change our determination as to the amount of deferred tax assets that can be realized, we will adjust our valuation allowance with a corresponding impact to the provision for income taxes in the period in which such determination is made.

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Our provision for income taxes is subject to volatility and could be adversely impacted by earnings being lower than anticipated in countries that have lower tax rates and higher than anticipated in countries that have higher tax rates; by changes in the valuation of our deferred tax assets and liabilities; by changes to domestic manufacturing deduction, foreign-derived intangible income, global intangible low-tax income and base erosion and anti-abuse tax laws, regulations, or interpretations thereof; by expiration of or lapses in tax incentives; by transfer pricing adjustments, including the effect of acquisitions on our legal structure; by tax effects of nondeductible compensation; by tax costs related to intercompany realignments; by changes in accounting principles; or by changes in tax laws and regulations, treaties, or interpretations thereof, including changes to the taxation of earnings of our foreign subsidiaries, the deductibility of expenses attributable to foreign income, and the foreign tax credit rules. Significant judgment is required to determine the recognition and measurement attributes prescribed in the accounting guidance for uncertainty in income taxes. The Organisation for Economic Co-operation and Development (OECD), an international association comprised of 36 countries, including the United States, has made changes to numerous long-standing tax principles. There can be no assurance that these changes, once adopted by countries, will not have an adverse impact on our provision for income taxes. As a result of certain of our ongoing employment and capital investment actions and commitments, our income in certain countries is subject to reduced tax rates. Our failure to meet these commitments could adversely impact our provision for income taxes. In addition, we are subject to the continuous examination of our income tax returns by the Internal Revenue Service (IRS) and other tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. There can be no assurance that the outcomes from these continuous examinations will not have an adverse impact on our operating results and financial condition.

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RESULTS OF OPERATIONS
Revenue
The following table presents the breakdown of revenue between product and service (in millions, except percentages):

	Three Months Ended [1]				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Revenue:								
Product	$9,273	$8,709	$ 564	6 %	$19,163	$17,763	$ 1,400	8 %
Percentage of revenue	74.5 %	73.3 %			75.1 %	73.9 %		
Service	3,173	3,178	(5)	— %	6,355	6,260	95	2 %
Percentage of revenue	25.5 %	26.7 %			24.9 %	26.1 %		
Total	$12,446	$11,887	$ 559	5 %	$25,518	$24,023	$ 1,495	6 %

(1) Total revenue, product revenue and service revenue not including the SPVSS business in the prior year period increased 7%, 9% and 1%, respectively.

We manage our business primarily on a geographic basis, organized into three geographic segments. Our revenue, which includes product and service for each segment, is summarized in the following table (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Revenue:								
Americas	$7,352	$7,004	$ 348	5 %	$15,103	$14,354	$ 749	5 %
Percentage of revenue	59.1 %	58.9 %			59.2 %	59.7 %		
EMEA	3,223	3,062	161	5 %	6,447	5,971	476	8 %
Percentage of revenue	25.9 %	25.8 %			25.3 %	24.9 %		
APJC	1,872	1,820	52	3 %	3,968	3,698	270	7 %
Percentage of revenue	15.0 %	15.3 %			15.5 %	15.4 %		
Total	$12,446	$11,887	$ 559	5 %	$25,518	$24,023	$ 1,495	6 %

Amounts may not sum and percentages may not recalculate due to rounding.

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

Total revenue increased by 5%. Product revenue increased by 6% while service revenue was flat. Our total revenue reflected growth across each of our geographic segments. Product revenue for the emerging countries of BRICM, in the aggregate, experienced 5% product revenue growth, with increases in Mexico, India, Brazil and Russia partially offset by a decrease in China.

In addition to the impact of macroeconomic factors, including a reduced IT spending environment and reductions in spending by government entities, revenue by segment in a particular period may be significantly impacted by several factors related to revenue recognition, including the complexity of transactions such as multiple performance obligations; the mix of financing arrangements provided to channel partners and customers; and final acceptance of the product, system, or solution, among other factors. In addition, certain customers tend to make large and sporadic purchases, and the revenue related to these transactions may also be affected by the timing of revenue recognition, which in turn would impact the revenue of the relevant segment. As has been the case in certain emerging countries from time to time, certain customers require greater levels of financing arrangements, service, and support, and these activities may occur in future periods, which may also impact the timing of the recognition of revenue.

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

Total revenue increased by 6%. Product revenue increased by 8% and service revenue increased by 2%. Our total revenue reflected growth across each of our geographic segments. Product revenue for the emerging countries of BRICM, in the aggregate, experienced 14% product revenue growth, with increases in Mexico, India, Russia and Brazil, partially offset by decrease in China.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

Product Revenue by Segment
The following table presents the breakdown of product revenue by segment (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Product revenue:								
Americas	$5,349	$ 4,988	$ 361	7 %	$11,060	$ 10,380	$ 680	7 %
Percentage of product revenue	57.7 %	57.3 %			57.7 %	58.4 %		
EMEA	2,512	2,375	137	6 %	5,039	4,614	425	9 %
Percentage of product revenue	27.1 %	27.3 %			26.3 %	26.0 %		
APJC	1,413	1,346	67	5 %	3,064	2,769	295	11 %
Percentage of product revenue	15.2 %	15.4 %			16.0 %	15.6 %		
Total	$9,273	$ 8,709	$ 564	6 %	$19,163	$ 17,763	$ 1,400	8 %

Amounts may not sum and percentages may not recalculate due to rounding.
Americas
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Product revenue in the Americas segment increased by 7%, led by solid growth in the public sector, enterprise and commercial markets, partially offset by a decline in the service provider market. From a country perspective, product revenue increased by 7% in the United States, 35% in Mexico, 11% in Canada and 14% in Brazil.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
The increase in product revenue in the Americas segment was led by growth in the enterprise, public sector and commercial markets. These increases were partially offset by a product revenue decline in the service provider market. From a country perspective, product revenue increased by 7% in the United States, 48% in Mexico, 16% in Canada and 7% in Brazil.
EMEA
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Product revenue in the EMEA segment increased by 6%, with growth in the public sector, enterprise and commercial markets partially offset by a decline in the service provider market. Product revenue from emerging countries within EMEA was flat and product revenue for the remainder of the EMEA segment, which primarily consists of countries in Western Europe, increased by 8%.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Product revenue in the EMEA segment increased by 9%, with growth across each of the customer markets in this geographic segment. Product revenue from emerging countries within EMEA increased by 5% and product revenue for the remainder of the EMEA segment increased by 11%.

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APJC
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Product revenue in the APJC segment increased by 5%, led by solid growth in the public sector and enterprise markets and, to a lesser extent, growth in the commercial market. These increases were partially offset by a product revenue decline in the service provider market. From a country perspective, product revenue in India and in Japan each increased by 18% while product revenue in China decreased by 16%.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Product revenue in the APJC segment increased 11%, with growth across each of the customer markets in this geographic segment. From a country perspective, product revenue increased by 36% in India and 13% in Japan while product revenue in China decreased by 8%.

Product Revenue by Groups of Similar Products
In addition to the primary view on a geographic basis, we also prepare financial information related to groups of similar products and customer markets for various purposes. We report our product revenue in the following categories: Infrastructure Platforms, Applications, Security, and Other Products. This aligns our product categories with our evolving business model. Prior period amounts have been reclassified to conform to the current period's presentation.
The following table presents revenue for groups of similar products (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Product revenue:								
Infrastructure Platforms	$7,128	$ 6,710	$ 418	6 %	$14,770	$ 13,690	$ 1,080	8 %
Applications	1,465	1,184	281	24 %	2,884	2,387	497	21 %
Security	658	557	101	18 %	1,308	1,142	166	15 %
Other Products	22	258	(236)	(91)%	200	544	(344)	(63)%
Total	$9,273	$ 8,709	$ 564	6 %	$19,163	$ 17,763	$ 1,400	8 %

Amounts may not sum and percentages may not recalculate due to rounding.
Infrastructure Platforms
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
The Infrastructure Platforms product category represents our core networking offerings related to switching, routing, wireless, and the data center. Infrastructure Platforms revenue increased by 6%, or $418 million. Switching had solid growth, with double digit revenue growth in campus switching driven by an increase in sales of our intent-based networking Catalyst 9000 Series. We also had double digit revenue growth from wireless products driven by our Wave 2 offerings as well as Meraki. Revenue from our routing products decreased due to weakness in the service provider market. Revenue from data center also decreased driven by lower sales of server products partially offset by revenue growth in our hyperconverged data center offering, HyperFlex.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Revenue from the Infrastructure Platforms product category increased 8% or $1,080 million, with strength across the portfolio. Switching had solid growth, with solid revenue growth in campus switching driven by an increase in sales of our intent-based networking Catalyst 9000 Series, and with revenue growth in data center switching driven by increased revenue from our Nexus 9000 Series. Routing experienced revenue growth driven by growth in the service provider market. We experienced double digit revenue growth from wireless products driven by our Wave 2 offerings and Meraki. Revenue from data center increased driven by higher sales of our hyperconverged data center offering, HyperFlex, and our server products.

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Applications
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
The Applications product category includes our collaboration offerings (unified communications, Cisco TelePresence and conferencing) as well as the Internet of Things (IoT) and analytics software offerings from Jasper and AppDynamics, respectively. Revenue in our Applications product category increased by 24%, or $281 million, with growth across all of the business. We had strong revenue growth in unified communications, Telepresence and analytics from AppDynamics.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Revenue in our Applications product category increased by 21%, or $497 million, with solid revenue growth in unified communications, TelePresence and analytics from AppDynamics.
Security
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Revenue in our Security product category increased 18%, or $101 million, driven by higher sales of identity and access, advance threat security and unified threat management products. The acquisition of Duo Security in the first quarter of fiscal 2019 also contributed to the revenue increase in this product category.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Revenue in our Security product category increased 15%, or $166 million, driven by higher sales of identity and access, advance threat security, unified threat management and web security products. The acquisition of Duo Security in the first quarter of fiscal 2019 also contributed to the revenue increase in this product category.
Other Products
The decrease in revenue from our Other Products category for the second quarter and first six months of fiscal 2019, compared to corresponding periods of fiscal 2018, was primarily driven by a decrease in revenue from the SPVSS business which we divested on October 28, 2018.

Service Revenue by Segment
The following table presents the breakdown of service revenue by segment (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Service revenue:								
Americas	$2,003	$ 2,016	$ (13)	(1)%	$4,043	$ 3,974	$ 69	2 %
Percentage of service revenue	63.1 %	63.4 %			63.6 %	63.5 %		
EMEA	711	687	24	3 %	1,408	1,357	51	4 %
Percentage of service revenue	22.4 %	21.6 %			22.2 %	21.7 %		
APJC	459	475	(16)	(3)%	904	929	(25)	(3)%
Percentage of service revenue	14.5 %	15.0 %			14.2 %	14.8 %		
Total	$3,173	$ 3,178	$ (5)	— %	$6,355	$ 6,260	$ 95	2 %

Amounts may not sum and percentages may not recalculate due to rounding.
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Service revenue was flat. Service revenue not including the SPVSS business in the prior year period increased by 1% . The service revenue increase in the EMEA segment offset the decreases in service revenue in our APJC and Americas segments.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Service revenue increased 2%, driven by an increase in software and solution support offerings. Service revenue increased in the Americas and EMEA segments, partially offset by decreased revenue in our APJC segment.

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Gross Margin

The following table presents the gross margin for products and services (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	AMOUNT		PERCENTAGE		AMOUNT		PERCENTAGE	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Gross margin:								
Product	$5,659	$ 5,355	61.0 %	61.5 %	$11,750	$ 10,794	61.3 %	60.8 %
Service	2,114	2,143	66.6 %	67.4 %	4,169	4,131	65.6 %	66.0 %
Total	$7,773	$ 7,498	62.5 %	63.1 %	$15,919	$ 14,925	62.4 %	62.1 %

Product Gross Margin

The following table summarizes the key factors that contributed to the change in product gross margin percentage for the second quarter and first six months of fiscal 2019, as compared with the corresponding prior year periods:

	Product Gross Margin Percentage	
	Three Months Ended	Six Months Ended
Fiscal 2018	61.5 %	60.8 %
Product pricing	(1.0)%	(1.5)%
Mix of products sold	0.3 %	(0.2)%
Productivity [(1)]	(0.2)%	1.1 %
Legal and indemnification settlements	(0.1)%	0.7 %
Impact from divestiture of SPVSS business	0.5 %	0.5 %
Other	— %	(0.1)%
Fiscal 2019	61.0 %	61.3 %

(1) Productivity includes overall manufacturing-related costs, such as component costs, warranty expense, provision for inventory, freight, logistics, shipment volume, and other items not categorized elsewhere.

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

Product gross margin decreased by 0.5 percentage points driven by unfavorable impacts from product pricing and productivity, partially offset by favorable product mix. Our product gross margin also benefited from the sale of our lower margin SPVSS business during the second quarter of fiscal 2019.

The negative pricing impact, which was lower than the year-over-year impact we experienced in the second quarter of fiscal 2018, was driven by typical market factors and impacted each of our geographic segments and customer markets. Our productivity was negatively impacted by higher costs of memory and other components, partially offset by cost reductions including value engineering efforts (e.g. component redesign, board configuration, test processes and transformation processes) and continued operational efficiency in manufacturing operations.

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

Product gross margin increased by 0.5 percentage points driven by productivity improvements, partially offset by unfavorable impacts from product pricing and product mix. A charge of $127 million to product cost of sales recorded in the first six months of fiscal 2018 related to legal and indemnification settlements also contributed to the increase. Our product gross margin also benefited from the sale of our lower margin SPVSS business during the second quarter of fiscal 2019.

Productivity improvements were driven by cost reductions including value engineering efforts (e.g. component redesign, board configuration, test processes, and transformation processes) and continued operational efficiency in manufacturing operations.

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Service Gross Margin
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Our service gross margin percentage decreased by 0.8 percentage points due to increased headcount-related costs and increased delivery costs, partially offset by favorable mix.
Our service gross margin normally experiences some fluctuations due to various factors such as the timing of contract initiations and renewals, our strategic investments in headcount, and the resources we deploy to support the overall service business. Another factor is the mix of service offerings, as the gross margin from our advanced services is typically lower than the gross margin from technical support services.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Service gross margin percentage decreased by 0.4 percentage points due to increased headcount-related costs and increased delivery costs. These cost impacts were partially offset by the resulting benefit to gross margin of higher sales volume.
Gross Margin by Segment
The following table presents the total gross margin for each segment (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	AMOUNT		PERCENTAGE		AMOUNT		PERCENTAGE	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Gross margin:								
Americas	$4,796	$ 4,614	65.2 %	65.9 %	$9,866	$ 9,336	65.3 %	65.0 %
EMEA	2,070	1,977	64.2 %	64.6 %	4,141	3,816	64.2 %	63.9 %
APJC	1,109	1,094	59.2 %	60.1 %	2,309	2,259	58.2 %	61.1 %
Segment total	7,975	7,685	64.1 %	64.7 %	16,316	15,411	63.9 %	64.2 %
Unallocated corporate items [1]	(202)	(187)			(397)	(486)		
Total	$7,773	$ 7,498	62.5 %	63.1 %	$15,919	$ 14,925	62.4 %	62.1 %

[1] The unallocated corporate items include the effects of amortization and impairments of acquisition-related intangible assets, share-based compensation expense, significant litigation settlements and other contingencies, charges related to asset impairments and restructurings, and certain other charges. We do not allocate these items to the gross margin for each segment because management does not include such information in measuring the performance of the operating segments.
Amounts may not sum and percentages may not recalculate due to rounding.
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
We experienced a gross margin percentage decrease in our Americas segment due to unfavorable impacts from pricing and mix, partially offset by productivity improvements.
The gross margin percentage decrease in our EMEA segment was due primarily to lower service gross margin. Product gross margin in this segment increased due to favorable product mix partially offset by negative impacts from productivity and pricing.
The APJC segment gross margin percentage decrease was due primarily to lower service gross margin. Product gross margin in this segment increased slightly due to favorable product mix and productivity improvements, partially offset by negative impacts from pricing.
The gross margin percentage for a particular segment may fluctuate, and period-to-period changes in such percentages may or may not be indicative of a trend for that segment.

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Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
The Americas segment had a gross margin percentage increase driven by productivity improvements, partially offset by unfavorable impacts from pricing and mix.
The gross margin percentage increase in our EMEA segment was due to productivity improvements and favorable mix, partially offset by negative impacts from pricing.
The APJC segment gross margin percentage decrease was due to negative impacts from pricing partially offset by favorable mix and productivity improvements.

Research and Development ("R&D"), Sales and Marketing, and General and Administrative ("G&A") Expenses
R&D, sales and marketing, and G&A expenses are summarized in the following table (in millions, except percentages):

	Three Months Ended				Six Months Ended			
	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent	January 26, 2019	January 27, 2018	Variance in Dollars	Variance in Percent
Research and development	$1,557	$ 1,549	$ 8	1 %	$3,165	$ 3,116	$ 49	2 %
Percentage of revenue	12.5 %	13.0 %			12.4 %	13.0 %		
Sales and marketing	2,271	2,235	36	2 %	4,681	4,569	112	2 %
Percentage of revenue	18.2 %	18.8 %			18.3 %	19.0 %		
General and administrative	509	483	26	5 %	720	1,040	(320)	(31)%
Percentage of revenue	4.1 %	4.1 %			2.8 %	4.3 %		
Total	$4,337	$ 4,267	$ 70	2 %	$8,566	$ 8,725	$ (159)	(2)%
Percentage of revenue	34.8 %	35.9 %			33.6 %	36.3 %		

R&D Expenses
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
R&D expenses increased slightly as increases in headcount-related expenses and acquisition-related/divestiture costs significantly offset the decrease in discretionary spending.
We continue to invest in R&D in order to bring a broad range of products to market in a timely fashion. If we believe that we are unable to enter a particular market in a timely manner with internally developed products, we may purchase or license technology from other businesses, or we may partner with or acquire businesses as an alternative to internal R&D.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
R&D expenses increased primarily due to higher headcount-related expenses and, to a lesser extent, higher contracted services and higher acquisition-related/divestiture costs. These increases were partially offset by lower discretionary spending and share-based compensation expense.

Sales and Marketing Expenses
Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Sales and marketing expenses increased due to higher discretionary spending, headcount-related expenses, contracted services and acquisition-related/divestiture costs, partially offset by lower share-based compensation expense.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Sales and marketing expenses increased due to higher discretionary spending, higher headcount-related expenses and, to a lesser extent, higher contracted services and higher acquisition-related/divestiture costs, partially offset by lower share-based compensation expense.

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G&A Expenses

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

G&A expenses increased due to higher discretionary spending and headcount-related expenses, partially offset by lower contracted services.

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

G&A expenses decreased due to a benefit from the $400 million litigation settlement with Arista, partially offset by higher discretionary spending, higher acquisition-related/divestiture costs and higher headcount-related expenses.

Effect of Foreign Currency

In the second quarter of fiscal 2019, foreign currency fluctuations, net of hedging, decreased the combined R&D, sales and marketing, and G&A expenses by approximately $52 million, or 1.2%, compared with the second quarter of fiscal 2018.

In the first six months of fiscal 2019, foreign currency fluctuations, net of hedging, decreased the combined R&D, sales and marketing, and G&A expenses by approximately $102 million, or 1.2%, compared with the first six months of fiscal 2018.

Share-Based Compensation Expense

The following table presents share-based compensation expense (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Cost of sales—product	$22	$ 23	$45	$ 46
Cost of sales—service	31	31	64	65
Share-based compensation expense in cost of sales	53	54	109	111
Research and development	133	134	263	270
Sales and marketing	125	135	262	270
General and administrative	65	64	127	128
Restructuring and other charges	19	12	42	18
Share-based compensation expense in operating expenses	342	345	694	686
Total share-based compensation expense	$395	$ 399	$803	$ 797

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

The decrease in share-based compensation expense was due primarily to higher forfeitures partially offset by higher restructuring charges.

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

The increase in share-based compensation expense was due primarily to higher restructuring charges.

Amortization of Purchased Intangible Assets

The following table presents the amortization of purchased intangible assets including impairment charges (in millions):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Amortization of purchased intangible assets:				
Cost of sales	$156	$ 160	$307	$ 314
Operating expenses	39	60	73	121
Total	$195	$ 220	$380	$ 435

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Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Amortization of purchased intangible assets decreased due largely to the purchased intangible assets related to the divestiture of SPVSS business on October 28, 2018, partially offset by amortization from our recent acquisitions.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Amortization of purchased intangible assets decreased due largely to the purchased intangible assets related to the divestiture of SPVSS business on October 28, 2018, partially offset by amortization from our recent acquisitions.
Restructuring and Other Charges
We initiated a restructuring plan during fiscal 2018 in order to realign our organization and enable further investment in key priority areas, with estimated pretax charges of approximately $600 million. In connection with this restructuring plan, we incurred charges of $186 million and $264 million for the second quarter and first six months of fiscal 2019, respectively, and have incurred cumulative charges of $372 million since inception. We expect this restructuring plan to be substantially completed in fiscal 2019.
We incurred restructuring and other charges of $98 million and $250 million for the second quarter and first six months of fiscal 2018 in connection with the restructuring plan announced in August 2016.
These charges were primarily cash-based and consisted of employee severance and other one-time termination benefits, and other associated costs. We expect to reinvest substantially all of the cost savings from these restructuring actions in our key priority areas. As a result, the overall cost savings from these restructuring actions are not expected to be material for future periods.
Operating Income
The following table presents our operating income and our operating income as a percentage of revenue (in millions, except percentages):

	Three Months Ended		Six Months Ended	
	January 26, 2019	January 27, 2018	January 26, 2019	January 27, 2018
Operating income	$3,211	$ 3,073	$7,016	$ 5,829
Operating income as a percentage of revenue	25.8 %	25.9 %	27.5 %	24.3 %

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018
Operating income increased by 4% and as a percentage of revenue operating income decreased by 0.1 percentage points. These changes resulted primarily from: a revenue increase, a gross margin percentage decrease (driven primarily by unfavorable impacts from pricing and productivity), and higher restructuring and other charges.
Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018
Operating income increased by 20% and as a percentage of revenue operating income increased by 3.2 percentage points. These increases resulted primarily from: a revenue increase, a gross margin percentage increase (driven primarily by productivity improvements and a charge of $127 million to product cost of sales recorded in the first six months of fiscal 2018 related to legal and indemnification settlements) and a benefit from the $400 million litigation settlement with Arista in the first quarter of fiscal 2019.

Interest and Other Income (Loss), Net
Interest Income (Expense), Net The following table summarizes interest income and interest expense (in millions):

	Three Months Ended			Six Months Ended		
	January 26, 2019	January 27, 2018	Variance in Dollars	January 26, 2019	January 27, 2018	Variance in Dollars
Interest income	$328	$ 396	$ (68)	$672	$ 775	$ (103)
Interest expense	(223)	(247)	24	(444)	(482)	38
Interest income (expense), net	$105	$ 149	$ (44)	$228	$ 293	$ (65)

Interest income decreased, driven by a decrease in the average balance of cash and available-for-sale debt investments. The decrease in interest expense was driven by a lower average debt balance, partially offset by the impact of higher effective interest rates.

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Other Income (Loss), Net The components of other income (loss), net, are summarized as follows (in millions):

	Three Months Ended			Six Months Ended		
	January 26, 2019	January 27, 2018	Variance in Dollars	January 26, 2019	January 27, 2018	Variance in Dollars
Gains (losses) on investments, net:						
Available-for-sale debt investments	$(5)	$ (96)	$ 91	$(11)	$ (92)	$ 81
Marketable equity investments	61	154	(93)	57	183	(126)
Non-marketable equity and other investments	(3)	2	(5)	1	37	(36)
Net gains (losses) on investments	53	60	(7)	47	128	(81)
Other gains (losses), net	(26)	(50)	24	(39)	(56)	17
Other income (loss), net	$27	$ 10	$ 17	$8	$ 72	$ (64)

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

The total change in net gains (losses) on available-for-sale debt investments was primarily attributable to lower realized losses as a result of market conditions, and the timing of sales of these investments.

The total change in net gains (losses) on marketable equity investments was attributable to market value fluctuations and the timing of recognition of gains and losses.

The change in net gains (losses) on non-marketable equity and other investments was primarily due to higher realized net losses, partially offset by higher unrealized gains and lower impairment charges.

The change in other gains (losses), net was primarily driven by net favorable foreign exchange impacts.

Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

The total change in net gains (losses) on available-for-sale debt investments was primarily attributable to lower realized losses as a result of market conditions, and the timing of sales of these investments.

The total change in net gains (losses) on marketable equity investments was attributable to market value fluctuations and the timing of recognition of gains and losses.

The change in net gains (losses) on non-marketable equity and other investments was primarily due to higher realized net losses, partially offset by higher unrealized gains and lower impairment charges.

The change in other gains (losses), net was driven by net favorable foreign exchange impacts partially offset by lower gains from customer lease terminations.

Provision for Income Taxes

Three Months Ended January 26, 2019 Compared with Three Months Ended January 27, 2018

The provision for income taxes resulted in an effective tax rate of 15.6% for the second quarter of fiscal 2019 compared with 371.6% for the second quarter of fiscal 2018. The decrease in the effective tax rate was primarily due to the one-time transition tax on accumulated earnings of foreign subsidiaries, foreign withholding tax, and DTA re-measurement recorded during the second quarter of fiscal 2018.

Our effective tax rate will increase or decrease based upon the tax effect of the difference between the share-based compensation expenses and the benefits taken on the company's tax returns. We recognize excess tax benefits on a discrete basis and therefore anticipate the effective tax rate to vary from quarter to quarter depending on our share price in each period.

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Six Months Ended January 26, 2019 Compared with Six Months Ended January 27, 2018

The provision for income taxes resulted in an effective tax rate of 12.1% for the first six months of fiscal 2019 compared with 203.1% for the first six months of fiscal 2018. The decrease in the effective tax rate was primarily due to the one-time transition tax on accumulated earnings of foreign subsidiaries, foreign withholding tax, and DTA re-measurement recorded during the first six months of fiscal 2018.

LIQUIDITY AND CAPITAL RESOURCES

The following sections discuss the effects of changes in our balance sheet, our capital allocation strategy including stock repurchase program and dividends, our contractual obligations, and certain other commitments and activities on our liquidity and capital resources.

Balance Sheet and Cash Flows

Cash and Cash Equivalents and Investments The following table summarizes our cash and cash equivalents and investments (in millions):

	January 26, 2019	July 28, 2018	Increase (Decrease)
Cash and cash equivalents	$ 9,835	$8,934	$ 901
Available-for-sale debt investments	30,486	37,009	(6,523)
Marketable equity securities	62	605	(543)
Total	$ 40,383	$46,548	$ (6,165)

The decrease in cash and cash equivalents and investments in the first six months of fiscal 2019 was primarily driven by cash returned to shareholders in the form of repurchases of common stock of $10.1 billion under the stock repurchase program and cash dividends of $3.0 billion; net cash paid for acquisitions and divestitures of $1.6 billion; and capital expenditures of $0.5 billion. These uses of cash were partially offset by cash provided by operating activities of $7.6 billion and timing of settlements of investments and other of $1.6 billion.

In addition to cash requirements in the normal course of business, in the third quarter of fiscal 2019 on February 6, 2019, we closed the acquisition of Luxtera for a purchase price of approximately $0.7 billion in cash and assumed equity awards. Also approximately $0.7 billion of the U.S. transition tax on accumulated earnings for foreign subsidiaries is payable in less than one year. Additionally, $9.7 billion of long term debt which was outstanding at January 26, 2019 (of which $2.0 billion was repaid on February 15, 2019) and approximately $2 billion of commercial paper notes (issued in February 2019) will mature within the next 12 months from the balance sheet date. See further discussion of liquidity under "Liquidity and Capital Resource Requirements" below.

We maintain an investment portfolio of various holdings, types, and maturities. We classify our investments as short-term investments based on their nature and their availability for use in current operations. We believe the overall credit quality of our portfolio is strong, with our cash equivalents and our available-for-sale debt investment portfolio consisting primarily of high quality investment-grade securities. We believe that our strong cash and cash equivalents and investments position allows us to use our cash resources for strategic investments to gain access to new technologies, for acquisitions, for customer financing activities, for working capital needs, and for the repurchase of shares of common stock and payment of dividends as discussed below.

Free Cash Flow and Capital Allocation As part of our capital allocation strategy, we intend to return a minimum of 50% of our free cash flow annually to our shareholders through cash dividends and repurchases of common stock. We define free cash flow as net cash provided by operating activities less cash used to acquire property and equipment. The following table reconciles our net cash provided by operating activities to free cash flow (in millions):

	Six Months Ended	
	January 26, 2019	January 27, 2018
Net cash provided by operating activities	$7,560	$ 7,150

Acquisition of property and equipment	(473)	(379)
Free cash flow	$7,087	$ 6,771

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We expect that cash provided by operating activities may fluctuate in future periods as a result of a number of factors, including fluctuations in our operating results, the rate at which products are shipped during the quarter (which we refer to as shipment linearity), the timing and collection of accounts receivable and financing receivables, inventory and supply chain management, deferred revenue, and the timing and amount of tax and other payments. For additional discussion, see "Part II, Item 1A. Risk Factors" in this report.

We consider free cash flow to be a liquidity measure that provides useful information to management and investors because of our intent to return a stated percentage of free cash flow to shareholders in the form of dividends and stock repurchases. We further regard free cash flow as a useful measure because it reflects cash that can be used to, among other things, invest in our business, make strategic acquisitions, repurchase common stock, and pay dividends on our common stock, after deducting capital investments. A limitation of the utility of free cash flow as a measure of financial performance and liquidity is that the free cash flow does not represent the total increase or decrease in our cash balance for the period. In addition, we have other required uses of cash, including repaying the principal of our outstanding indebtedness. Free cash flow is not a measure calculated in accordance with U.S. generally accepted accounting principles and should not be regarded in isolation or as an alternative for net income provided by operating activities or any other measure calculated in accordance with such principles, and other companies may calculate free cash flow in a different manner than we do.

The following table summarizes the dividends paid and stock repurchases (in millions, except per-share amounts):

	DIVIDENDS		STOCK REPURCHASE PROGRAM			
Quarter Ended	Per Share	Amount	Shares	Weighted-Average Price per Share	Amount	TOTAL
Fiscal 2019						
January 26, 2019	$0.33	$ 1,470	111	$ 45.09	$ 5,016	$ 6,486
October 27, 2018	$0.33	$ 1,500	109	$ 46.01	$ 5,026	$ 6,526
Fiscal 2018						
July 28, 2018	$0.33	$ 1,535	138	$ 43.58	$ 6,015	$ 7,550
April 28, 2018	$0.33	$ 1,572	140	$ 42.83	$ 6,015	$ 7,587
January 27, 2018	$0.29	$ 1,425	103	$ 39.07	$ 4,011	$ 5,436
October 28, 2017	$0.29	$ 1,436	51	$ 31.80	$ 1,620	$ 3,056

On February 13, 2019, our Board of Directors declared a quarterly dividend of $0.35 per common share to be paid on April 24, 2019 to all shareholders of record as of the close of business on April 5, 2019. Any future dividends are subject to the approval of our Board of Directors.

On February 13, 2019, our Board of Directors authorized a $15 billion increase to the stock repurchase program. The remaining authorized amount for stock repurchases under this program, including the additional authorization, is approximately $24 billion, with no termination date.

The purchase price for the shares of our stock repurchased is reflected as a reduction to shareholders' equity. We are required to allocate the purchase price of the repurchased shares as (i) a reduction to retained earnings and (ii) a reduction of common stock and additional paid-in capital. As a result of future stock repurchases, we may report an accumulated deficit in future periods in shareholders' equity.

Accounts Receivable, Net The following table summarizes our accounts receivable, net (in millions):

	January 26, 2019	July 28, 2018	Increase (Decrease)
Accounts receivable, net	$ 3,745	$ 5,554	$ (1,809)

Our accounts receivable net, as of January 26, 2019 decreased by approximately 33%, as compared with the end of fiscal 2018, primarily due to product and service billings being more linear in the second quarter of fiscal 2019 compared with the fourth quarter of fiscal 2018.

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Inventory Supply Chain The following table summarizes our inventories and purchase commitments with contract manufacturers and suppliers (in millions):

	January 26, 2019	July 28, 2018	Increase (Decrease)
Inventories	$ 1,701	$ 1,846	$ (145)

Inventory as of January 26, 2019 decreased by 8% from our inventory balance at the end of fiscal 2018. The decrease in inventory was due primarily to lower deferred cost of sales related to the adoption of ASC 606 in the beginning of our first quarter of fiscal 2019.

We purchase components from a variety of suppliers and use several contract manufacturers to provide manufacturing services for our products. During the normal course of business, in order to manage manufacturing lead times and help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that allow them to procure inventory based upon criteria as defined by us or that establish the parameters defining our requirements and our commitment to securing manufacturing capacity.

Our purchase commitments are for short-term product manufacturing requirements as well as for commitments to suppliers to secure manufacturing capacity. Certain of our purchase commitments with contract manufacturers and suppliers relate to arrangements to secure long-term pricing for certain product components for multi-year periods. A significant portion of our reported purchase commitments arising from these agreements are firm, noncancelable, and unconditional commitments. In certain instances, these agreements allow us the option to cancel, reschedule, and adjust our requirements based on our business needs prior to firm orders being placed. We believe our inventory and purchase commitments levels are in line with our current demand forecasts. The following table summarizes our purchase commitments with contract manufacturers and suppliers as of the respective period ends (in millions):

Commitments by Period	January 26, 2019	July 28, 2018
Less than 1 year	$ 5,366	$ 5,407
1 to 3 years	731	710
3 to 5 years	180	360
Total	$ 6,277	$ 6,477

Purchase commitments with contract manufacturers and suppliers decreased 3% compared to the end of fiscal 2018. On a combined basis, inventories and purchase commitments with contract manufacturers and suppliers decreased by 4% compared with the end of fiscal 2018.

Inventory and supply chain management remain areas of focus as we balance the need to maintain supply chain flexibility to help ensure competitive lead times with the risk of inventory obsolescence because of rapidly changing technology and customer requirements. We believe the amount of our inventory and purchase commitments is appropriate for our revenue levels.

Financing Receivables and Guarantees The following table summarizes our financing receivables (in millions):

	January 26, 2019	July 28, 2018	Increase (Decrease)
Lease receivables, net	$ 2,371	$ 2,576	$ (205)
Loan receivables, net	4,862	4,939	(77)
Financed service contracts, net	2,389	2,316	73
Total, net	$ 9,622	$ 9,831	$ (209)

Financing Receivables Our financing arrangements include leases, loans, and financed service contracts. Lease receivables include sales-type and direct-financing leases. Arrangements related to leases are generally collateralized by a security interest in the underlying assets. Our loan receivables include customer financing for purchases of our hardware, software and services and also may include additional funds for other costs associated with network installation and integration of our products and services. We also provide financing to certain qualified customers for long-term service contracts, which primarily relate to technical support services. The majority of the revenue from these financed service contracts is deferred and is recognized ratably over the period during which the services are performed. Financing receivables decreased by 2%. We expect to continue to expand the use of our financing programs in the near term.

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Financing Guarantees In the normal course of business, third parties may provide financing arrangements to our customers and channel partners under financing programs. The financing arrangements to customers provided by third parties are related to leases and loans and typically have terms of up to three years. In some cases, we provide guarantees to third parties for these lease and loan arrangements. The financing arrangements to channel partners consist of revolving short-term financing provided by third parties, generally with payment terms ranging from 60 to 90 days. In certain instances, these financing arrangements result in a transfer of our receivables to the third party. The receivables are derecognized upon transfer, as these transfers qualify as true sales, and we receive payments for the receivables from the third party based on our standard payment terms.

The volume of channel partner financing was $14.5 billion and $13.6 billion for the first six months of fiscal 2019 and 2018, respectively. These financing arrangements facilitate the working capital requirements of the channel partners, and in some cases, we guarantee a portion of these arrangements. The balance of the channel partner financing subject to guarantees was $1.3 billion and $1.0 billion as of January 26, 2019 and July 28, 2018, respectively. We could be called upon to make payments under these guarantees in the event of nonpayment by the channel partners or end-user customers. Historically, our payments under these arrangements have been immaterial. Where we provide a guarantee, we defer the revenue associated with the channel partner and end-user financing arrangement in accordance with revenue recognition policies, or we record a liability for the fair value of the guarantees. In either case, the deferred revenue is recognized as revenue when the guarantee is removed. As of January 26, 2019, the total maximum potential future payments related to these guarantees was approximately $363 million, of which approximately $86 million was recorded as deferred revenue.

Borrowings

Senior Notes The following table summarizes the principal amount of our senior notes (in millions):

	Maturity Date	January 26, 2019	July 28, 2018
Senior notes:			
Floating-rate notes:			
Three-month LIBOR plus 0.50%	March 1, 2019	$ 500	$ 500
Three-month LIBOR plus 0.34%	September 20, 2019	500	500
Fixed-rate notes:			
4.95%	February 15, 2019	2,000	2,000
1.60%	February 28, 2019	1,000	1,000
2.125%	March 1, 2019	1,750	1,750
1.40%	September 20, 2019	1,500	1,500
4.45%	January 15, 2020	2,500	2,500
2.45%	June 15, 2020	1,500	1,500
2.20%	February 28, 2021	2,500	2,500
2.90%	March 4, 2021	500	500
1.85%	September 20, 2021	2,000	2,000
3.00%	June 15, 2022	500	500
2.60%		500	500

	February 28, 2023		
2.20%	September 20, 2023	750	750
3.625%	March 4, 2024	1,000	1,000
3.50%	June 15, 2025	500	500
2.95%	February 28, 2026	750	750
2.50%	September 20, 2026	1,500	1,500
5.90%	February 15, 2039	2,000	2,000
5.50%	January 15, 2040	2,000	2,000
Total		$ 25,750	$ 25,750

We repaid our senior notes due on February 15, 2019 for an aggregate principal amount of $2.0 billion upon maturity. Interest is payable semiannually on each class of the senior fixed-rate notes, each of which is redeemable by us at any time, subject to a make-whole premium. Interest is payable quarterly on the floating-rate notes. We were in compliance with all debt covenants as of January 26, 2019.

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MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

Commercial Paper We have a short-term debt financing program in which up to $10.0 billion is available through the issuance of commercial paper notes. We use the proceeds from the issuance of commercial paper notes for general corporate purposes. We had no commercial paper notes outstanding as of January 26, 2019 and July 28, 2018. As of February 18, 2019, we had approximately $2 billion of commercial paper notes outstanding.

Credit Facility On May 15, 2015, we entered into a credit agreement with certain institutional lenders that provides for a $3.0 billion unsecured revolving credit facility that is scheduled to expire on May 15, 2020. Any advances under the credit agreement will accrue interest at rates that are equal to, based on certain conditions, either (i) the highest of (a) the Federal Funds rate plus 0.50%, (b) Bank of America's "prime rate" as announced from time to time, or (c) LIBOR, or a comparable or successor rate that is approved by the Administrative Agent ("Eurocurrency Rate"), for an interest period of one month plus 1.00%, or (ii) the Eurocurrency Rate, plus a margin that is based on our senior debt credit ratings as published by Standard & Poor's Financial Services, LLC and Moody's Investors Service, Inc., provided that in no event will the Eurocurrency Rate be less than zero. We may also, upon the agreement of either the then-existing lenders or additional lenders not currently parties to the agreement, increase the commitments under the credit facility by up to an additional $2.0 billion and/or extend the expiration date of the credit facility up to May 15, 2022. This credit agreement requires that we comply with certain covenants, including that we maintain an interest coverage ratio as defined in the agreement. As of January 26, 2019, we were in compliance with the required interest coverage ratio and the other covenants, and we had not borrowed any funds under the credit facility.

Deferred Revenue The following table presents the breakdown of deferred revenue (in millions):

	January 26, 2019	July 28, 2018	Increase (Decrease)
Service	$ 11,246	$11,431	$ (185)
Product	6,015	8,254	(2,239)
Total	$ 17,261	$19,685	$ (2,424)
Reported as:			
Current	$ 9,976	$11,490	$ (1,514)
Noncurrent	7,285	8,195	(910)
Total	$ 17,261	$19,685	$ (2,424)

Deferred revenue decreased primarily due to the adoption of ASC 606 in the beginning of our first quarter of fiscal 2019. Of the total deferred revenue decrease related to ASC 606 of $2.8 billion, $2.6 billion relates to deferred product revenue and $0.2 billion relates to deferred service revenue. Of the adjustment to deferred product revenue, $1.3 billion relates to our recurring software and subscription offers, $0.6 billion relates to two-tier distribution, and the remainder relates to non-recurring software and other adjustments.

Contractual Obligations

Operating Leases

We lease office space in many U.S. locations. Outside the United States, larger leased sites include sites in Australia, Belgium, Canada, China, Germany, India, Japan, Mexico, Poland and the United Kingdom. We also lease equipment and vehicles. The future minimum lease payments under all of our noncancelable operating leases with an initial term in excess of one year as of January 26, 2019 were $1.2 billion.

Transition Tax Payable

The income tax payable outstanding as of January 26, 2019 for the U.S. transition tax on accumulated earnings for foreign subsidiaries is $7.4 billion. Approximately $0.7 billion is payable in less than one year; $1.3 billion is payable between 1 to 3 years; $1.9 billion is payable between 3 to 5 years; and the remaining $3.5 billion is payable in more than 5 years. See Note 17 to the Consolidated Financial Statements.

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CISCO SYSTEMS, INC.
MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS (Continued)

Other Commitments
In connection with our acquisitions, we have agreed to pay certain additional amounts contingent upon the achievement of certain agreed-upon technology, development, product, or other milestones or the continued employment with us of certain employees of the acquired entities. See Note 13 to the Consolidated Financial Statements.
Other Funding Commitments We also have certain funding commitments primarily related to our non-marketable equity and other investments, some of which are based on the achievement of certain agreed-upon milestones, and some of which are required to be funded on demand. The funding commitments were $357 million as of January 26, 2019, compared with $223 million as of July 28, 2018.

Off-Balance Sheet Arrangements
We consider our investments in unconsolidated variable interest entities to be off-balance sheet arrangements. In the ordinary course of business, we have non-marketable equity and other investments and provide financing to certain customers. Certain of these investments are considered to be variable interest entities. We evaluate on an ongoing basis our non-marketable equity and other investments and customer financings, and we have determined that as of January 26, 2019 there were no material unconsolidated variable interest entities.
On an ongoing basis, we reassess our non-marketable equity and other investments and customer financings to determine if they are variable interest entities and if we would be regarded as the primary beneficiary pursuant to the applicable accounting guidance. As a result of this ongoing assessment, we may be required to make additional disclosures or consolidate these entities. Because we may not control these entities, we may not have the ability to influence these events.
We provide financing guarantees, which are generally for various third-party financing arrangements extended to our channel partners and end-user customers. We could be called upon to make payments under these guarantees in the event of nonpayment by the channel partners or end-user customers. See the previous discussion of these financing guarantees under "Financing Receivables and Guarantees."
Liquidity and Capital Resource Requirements
Based on past performance and current expectations, we believe our cash and cash equivalents, investments, cash generated from operations, and ability to access capital markets and committed credit lines will satisfy, through at least the next 12 months, our liquidity requirements, both in total and domestically, including the following: working capital needs, capital expenditures, investment requirements, stock repurchases, cash dividends, contractual obligations, commitments, principal and interest payments on debt, pending acquisitions, future customer financings, and other liquidity requirements associated with our operations. There are no other transactions, arrangements, or relationships with unconsolidated entities or other persons that are reasonably likely to materially affect the liquidity and the availability of, as well as our requirements for, capital resources.

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Item 3. Quantitative and Qualitative Disclosures About Market Risk

Our financial position is exposed to a variety of risks, including interest rate risk, equity price risk, and foreign currency exchange risk.

Interest Rate Risk

Available-for-Sale Debt Investments We maintain an investment portfolio of various holdings, types, and maturities. Our primary objective for holding available-for-sale debt investments is to achieve an appropriate investment return consistent with preserving principal and managing risk. At any time, a sharp rise in market interest rates could have a material adverse impact on the fair value of our available-for-sale debt investment portfolio. Conversely, declines in interest rates, including the impact from lower credit spreads, could have a material adverse impact on interest income for our investment portfolio. We may utilize derivative instruments designated as hedging instruments to achieve our investment objectives. We had no outstanding hedging instruments for our available-for-sale debt investments as of January 26, 2019. Our available-for-sale debt investments are held for purposes other than trading. Our available-for-sale debt investments are not leveraged as of January 26, 2019. We monitor our interest rate and credit risks, including our credit exposures to specific rating categories and to individual issuers. We believe the overall credit quality of our portfolio is strong.

Financing Receivables As of January 26, 2019, our financing receivables had a carrying value of $9.6 billion, compared with $9.8 billion as of July 28, 2018. As of January 26, 2019, a hypothetical 50 basis points ("BPS") increase or decrease in market interest rates would change the fair value of our financing receivables by a decrease or increase of approximately $0.1 billion, respectively.

Debt As of January 26, 2019, we had $25.8 billion in principal amount of senior notes outstanding, which consisted of $1.0 billion floating-rate notes and $24.8 billion fixed-rate notes. The carrying amount of the senior notes was $25.6 billion, and the related fair value based on market prices was $26.5 billion. As of January 26, 2019, a hypothetical 50 BPS increase or decrease in market interest rates would change the fair value of the fixed-rate debt, excluding the $6.8 billion of hedged debt, by a decrease or increase of approximately $0.5 billion, respectively. However, this hypothetical change in interest rates would not impact the interest expense on the fixed-rate debt that is not hedged.

Equity Price Risk

Marketable Equity Investments. The fair value of our marketable equity investments is subject to market price volatility. We may hold equity securities for strategic purposes or to diversify our overall investment portfolio. These equity securities are held for purposes other than trading. To manage our exposure to changes in the fair value of certain equity securities, we may enter into equity derivatives designated as hedging instruments. As of January 26, 2019, the total fair value of our investments in marketable equity securities was $62 million.

Non-marketable Equity and Other Investments These investments are recorded in other assets in our Consolidated Balance Sheets. As of January 26, 2019, the total carrying amount of our investments in non-marketable equity and other investments was $1.25 billion, compared with $1.1 billion at July 28, 2018. Some of these companies in which we invested are in the startup or development stages. These investments are inherently risky because the markets for the technologies or products these companies are developing are typically in the early stages and may never materialize. We could lose our entire investment in these companies. Our evaluation of non-marketable equity and other investments is based on the fundamentals of the businesses invested in, including, among other factors, the nature of their technologies and potential for financial return.

Foreign Currency Exchange Risk

Our foreign exchange forward and option contracts outstanding as of the respective period-ends are summarized in U.S. dollar equivalents as follows (in millions):

	January 26, 2019		July 28, 2018	
	Notional Amount	Fair Value	Notional Amount	Fair Value
Forward contracts:				
Purchased	$2,170	$ —	$1,850	$ (2)

Sold	$1,361	$ (1)	$845	$ 2
Option contracts:				
Purchased	$155	$ 1	$—	$ —
Sold	$146	$ (1)	$—	$ —

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We conduct business globally in numerous currencies. The direct effect of foreign currency fluctuations on revenue has not been material because our revenue is primarily denominated in U.S. dollars. However, if the U.S. dollar strengthens relative to other currencies, such strengthening could have an indirect effect on our revenue to the extent it raises the cost of our products to non-U.S. customers and thereby reduces demand. A weaker U.S. dollar could have the opposite effect. However, the precise indirect effect of currency fluctuations is difficult to measure or predict because our revenue is influenced by many factors in addition to the impact of such currency fluctuations.
Approximately 70% of our operating expenses are U.S.-dollar denominated. In the first six months of fiscal 2019, foreign currency fluctuations, net of hedging, decreased our combined R&D, sales and marketing, and G&A expenses by approximately $102 million, or 1.2%, compared with the first six months of fiscal 2018. To reduce variability in operating expenses and service cost of sales caused by non-U.S.-dollar denominated operating expenses and costs, we may hedge certain forecasted foreign currency transactions with currency options and forward contracts. These hedging programs are not designed to provide foreign currency protection over long time horizons. In designing a specific hedging approach, we consider several factors, including offsetting exposures, significance of exposures, costs associated with entering into a particular hedge instrument, and potential effectiveness of the hedge. The gains and losses on foreign exchange contracts mitigate the effect of currency movements on our operating expenses and service cost of sales.
We also enter into foreign exchange forward and option contracts to reduce the short-term effects of foreign currency fluctuations on receivables and payables that are denominated in currencies other than the functional currencies of the entities. The market risks associated with these foreign currency receivables, investments, and payables relate primarily to variances from our forecasted foreign currency transactions and balances. We do not enter into foreign exchange forward or option contracts for speculative purposes.

Item 4. Controls and Procedures

Evaluation of disclosure controls and procedures. Based on our management's evaluation (with the participation of our principal executive officer and principal financial officer), as of the end of the period covered by this report, our principal executive officer and principal financial officer have concluded that our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, (the "Exchange Act")) are effective to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in Securities and Exchange Commission rules and forms and is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosure.
Changes in internal control over financial reporting. There was no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during our second quarter of fiscal 2019 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1. Legal Proceedings

For a description of our material pending legal proceedings, see Note 13 "Commitments and Contingencies—(g) Legal Proceedings" of the Notes to Consolidated Financial Statements included in Item 1 of this Form 10-Q.

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Item 1A. Risk Factors

Set forth below and elsewhere in this report and in other documents we file with the SEC are descriptions of the risks and uncertainties that could cause our actual results to differ materially from the results contemplated by the forward-looking statements contained in this report. The descriptions below include any material changes to and supersede the description of the risk factors affecting our business previously disclosed in “Part I, Item 1A. Risk Factors” of our Annual Report on Form 10-K for the fiscal year ended July 28, 2018.

OUR OPERATING RESULTS MAY FLUCTUATE IN FUTURE PERIODS, WHICH MAY ADVERSELY AFFECT OUR STOCK PRICE

Our operating results have been in the past, and will continue to be, subject to quarterly and annual fluctuations as a result of numerous factors, some of which may contribute to more pronounced fluctuations in an uncertain global economic environment. These factors include:

- Fluctuations in demand for our products and services, especially with respect to service providers and Internet businesses, in part due to changes in the global economic environment
- Changes in sales and implementation cycles for our products and reduced visibility into our customers’ spending plans and associated revenue
- Our ability to maintain appropriate inventory levels and purchase commitments
- Price and product competition in the communications and networking industries, which can change rapidly due to technological innovation and different business models from various geographic regions
- The overall movement toward industry consolidation among both our competitors and our customers
- The introduction and market acceptance of new technologies and products, and our success in new and evolving markets, and in emerging technologies, as well as the adoption of new standards
- The transformation of our business to deliver more software and subscription offerings where revenue is recognized over time
- Variations in sales channels, product costs, mix of products sold, or mix of direct sales and indirect sales
- The timing, size, and mix of orders from customers
- Manufacturing and customer lead times
- Fluctuations in our gross margins, and the factors that contribute to such fluctuations, as described below
- The ability of our customers, channel partners, contract manufacturers and suppliers to obtain financing or to fund capital expenditures, especially during a period of global credit market disruption or in the event of customer, channel partner, contract manufacturer or supplier financial problems
- Actual events, circumstances, outcomes, and amounts differing from judgments, assumptions, and estimates used in determining the values of certain assets (including the amounts of related valuation allowances), liabilities, and other items reflected in our Consolidated Financial Statements
- How well we execute on our strategy and operating plans and the impact of changes in our business model that could result in significant restructuring charges
- Our ability to achieve targeted cost reductions
- Benefits anticipated from our investments in engineering, sales, service, and marketing
- Changes in tax laws or accounting rules, or interpretations thereof

As a consequence, operating results for a particular future period are difficult to predict, and, therefore, prior results are not necessarily indicative of results to be expected in future periods. Any of the foregoing factors, or any other factors discussed elsewhere herein, could have a material adverse effect on our business, results of operations, and financial condition that could adversely affect our stock price.

OUR OPERATING RESULTS MAY BE ADVERSELY AFFECTED BY UNFAVORABLE ECONOMIC AND MARKET CONDITIONS AND THE UNCERTAIN GEOPOLITICAL ENVIRONMENT

Challenging economic conditions worldwide have from time to time contributed, and may continue to contribute, to slowdowns in the communications and networking industries at large, as well as in specific segments and markets in which we operate, resulting in:

- Reduced demand for our products as a result of continued constraints on IT-related capital spending by our customers, particularly service providers, and other customer markets as well
- Increased price competition for our products, not only from our competitors but also as a consequence of customers disposing of unutilized products
- Risk of excess and obsolete inventories
- Risk of supply constraints
- Risk of excess facilities and manufacturing capacity
- Higher overhead costs as a percentage of revenue and higher interest expense

The global macroeconomic environment has been challenging and inconsistent. Instability in the global credit markets, the impact of uncertainty regarding global central bank monetary policy, the instability in the geopolitical environment in many parts of the world including as a result of the pending United Kingdom "Brexit" withdrawal from the European Union, the current economic challenges in China, including global economic ramifications of Chinese economic difficulties, and other disruptions may continue to put pressure on global economic conditions. If global economic and market conditions, or economic conditions in key markets, remain uncertain or deteriorate further, we may experience material impacts on our business, operating results, and financial condition.

Our operating results in one or more segments may also be affected by uncertain or changing economic conditions particularly germane to that segment or to particular customer markets within that segment. For example, emerging countries in the aggregate experienced a decline in product orders in certain prior periods.

In addition, reports of certain intelligence gathering methods of the U.S. government could affect customers' perception of the products of IT companies which design and manufacture products in the United States. Trust and confidence in us as an IT supplier is critical to the development and growth of our markets. Impairment of that trust, or foreign regulatory actions taken in response to reports of certain intelligence gathering methods of the U.S. government, could affect the demand for our products from customers outside of the United States and could have an adverse effect on our operating results.

WE HAVE BEEN INVESTING AND EXPECT TO CONTINUE TO INVEST IN KEY PRIORITY AND GROWTH AREAS AS WELL AS MAINTAINING LEADERSHIP IN INFRASTRUCTURE PLATFORMS AND IN SERVICES, AND IF THE RETURN ON THESE INVESTMENTS IS LOWER OR DEVELOPS MORE SLOWLY THAN WE EXPECT, OUR OPERATING RESULTS MAY BE HARMED

We expect to realign and dedicate resources into key priority and growth areas, such as Security and Applications, while also focusing on maintaining leadership in Infrastructure Platforms and in Services. However, the return on our investments may be lower, or may develop more slowly, than we expect. If we do not achieve the benefits anticipated from these investments (including if our selection of areas for investment does not play out as we expect), or if the achievement of these benefits is delayed, our operating results may be adversely affected.

OUR REVENUE FOR A PARTICULAR PERIOD IS DIFFICULT TO PREDICT, AND A SHORTFALL IN REVENUE MAY HARM OUR OPERATING RESULTS

As a result of a variety of factors discussed in this report, our revenue for a particular quarter is difficult to predict, especially in light of a challenging and inconsistent global macroeconomic environment and related market uncertainty.

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Our revenue may grow at a slower rate than in past periods or decline as it did in the first quarter of fiscal 2018, and in certain prior periods on a year-over-year basis. Our ability to meet financial expectations could also be adversely affected if the nonlinear sales pattern seen in some of our past quarters recurs in future periods. We have experienced periods of time during which shipments have exceeded net bookings or manufacturing issues have delayed shipments, leading to nonlinearity in shipping patterns. In addition to making it difficult to predict revenue for a particular period, nonlinearity in shipping can increase costs, because irregular shipment patterns result in periods of underutilized capacity and periods in which overtime expenses may be incurred, as well as in potential additional inventory management-related costs. In addition, to the extent that manufacturing issues and any related component shortages result in delayed shipments in the future, and particularly in periods in which our contract manufacturers are operating at higher levels of capacity, it is possible that revenue for a quarter could be adversely affected if such matters occur and are not remediated within the same quarter.

The timing of large orders can also have a significant effect on our business and operating results from quarter to quarter, primarily in the United States and in emerging countries. From time to time, we receive large orders that have a significant effect on our operating results in the period in which the order is recognized as revenue. The timing of such orders is difficult to predict, and the timing of revenue recognition from such orders may affect period to period changes in revenue. As a result, our operating results could vary materially from quarter to quarter based on the receipt of such orders and their ultimate recognition as revenue.

Inventory management remains an area of focus. We have experienced longer than normal manufacturing lead times in the past which have caused some customers to place the same order multiple times within our various sales channels and to cancel the duplicative orders upon receipt of the product, or to place orders with other vendors with shorter manufacturing lead times. Such multiple ordering (along with other factors) or risk of order cancellation may cause difficulty in predicting our revenue and, as a result, could impair our ability to manage parts inventory effectively. In addition, our efforts to improve manufacturing lead-time performance may result in corresponding reductions in order backlog. A decline in backlog levels could result in more variability and less predictability in our quarter-to-quarter revenue and operating results. In addition, when facing component supply-related challenges we have increased our efforts in procuring components in order to meet customer expectations, which in turn contribute to an increase in purchase commitments. Increases in our purchase commitments to shorten lead times could also lead to excess and obsolete inventory charges if the demand for our products is less than our expectations.

We plan our operating expense levels based primarily on forecasted revenue levels. These expenses and the impact of long-term commitments are relatively fixed in the short term. A shortfall in revenue could lead to operating results being below expectations because we may not be able to quickly reduce these fixed expenses in response to short-term business changes.

Any of the above factors could have a material adverse impact on our operations and financial results.

WE EXPECT GROSS MARGIN TO VARY OVER TIME, AND OUR LEVEL OF PRODUCT GROSS MARGIN MAY NOT BE SUSTAINABLE

Our product gross margins declined in the second quarter of fiscal 2019 and in certain prior periods on a year-over-year basis, and could decline in future quarters due to adverse impacts from various factors, including:

- Changes in customer, geographic, or product mix, including mix of configurations within each product group
- Introduction of new products, including products with price-performance advantages, and new business models including the transformation of our business to deliver more software and subscription offerings
- Our ability to reduce production costs
- Entry into new markets or growth in lower margin markets, including markets with different pricing and cost structures, through acquisitions or internal development
- Sales discounts
- Increases in material, labor or other manufacturing-related costs, which could be significant especially during periods of supply constraints such as those impacting the market for memory components
- Excess inventory and inventory holding charges
- Obsolescence charges
- Changes in shipment volume

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- The timing of revenue recognition and revenue deferrals
- Increased cost (including those caused by tariffs), loss of cost savings or dilution of savings due to changes in component pricing or charges incurred due to inventory holding periods if parts ordering does not correctly anticipate product demand or if the financial health of either contract manufacturers or suppliers deteriorates
- Lower than expected benefits from value engineering
- Increased price competition, including competitors from Asia, especially from China
- Changes in distribution channels
- Increased warranty costs
- Increased amortization of purchased intangible assets, especially from acquisitions
- How well we execute on our strategy and operating plans

Changes in service gross margin may result from various factors such as changes in the mix between technical support services and advanced services, as well as the timing of technical support service contract initiations and renewals and the addition of personnel and other resources to support higher levels of service business in future periods.

SALES TO THE SERVICE PROVIDER MARKET ARE ESPECIALLY VOLATILE, AND WEAKNESS IN ORDERS FROM THIS INDUSTRY MAY HARM OUR OPERATING RESULTS AND FINANCIAL CONDITION

Sales to the service provider market have been characterized by large and sporadic purchases, especially relating to our router sales and sales of certain other Infrastructure Platforms and Applications products, in addition to longer sales cycles. Service provider product orders decreased in the second quarter of fiscal 2019, and in certain prior periods, and at various times in the past we have experienced significant weakness in product orders from service providers. Product orders from the service provider market could continue to decline and, as has been the case in the past, such weakness could persist over extended periods of time given fluctuating market conditions. Sales activity in this industry depends upon the stage of completion of expanding network infrastructures; the availability of funding; and the extent to which service providers are affected by regulatory, economic, and business conditions in the country of operations. Weakness in orders from this industry, including as a result of any slowdown in capital expenditures by service providers (which may be more prevalent during a global economic downturn, or periods of economic, political or regulatory uncertainty), could have a material adverse effect on our business, operating results, and financial condition. Such slowdowns may continue or recur in future periods. Orders from this industry could decline for many reasons other than the competitiveness of our products and services within their respective markets. For example, in the past, many of our service provider customers have been materially and adversely affected by slowdowns in the general economy, by overcapacity, by changes in the service provider market, by regulatory developments, and by constraints on capital availability, resulting in business failures and substantial reductions in spending and expansion plans. These conditions have materially harmed our business and operating results in the past, and some of these or other conditions in the service provider market could affect our business and operating results in any future period. Finally, service provider customers typically have longer implementation cycles; require a broader range of services, including design services; demand that vendors take on a larger share of risks; often require acceptance provisions, which can lead to a delay in revenue recognition; and expect financing from vendors. All these factors can add further risk to business conducted with service providers.

DISRUPTION OF OR CHANGES IN OUR DISTRIBUTION MODEL COULD HARM OUR SALES AND MARGINS

If we fail to manage distribution of our products and services properly, or if our distributors' financial condition or operations weaken, our revenue and gross margins could be adversely affected.

A substantial portion of our products and services is sold through our channel partners, and the remainder is sold through direct sales. Our channel partners include systems integrators, service providers, other resellers, and distributors. Systems integrators and service providers typically sell directly to end users and often provide system installation, technical support, professional services, and other support services in addition to network equipment sales. Systems integrators also typically integrate our products into an overall solution, and a number of service providers are also systems integrators. Distributors stock inventory and typically sell to systems integrators, service providers, and other resellers. We refer to sales through distributors as our two-tier system of sales to the end customer. These distributors are generally given business terms that allow them to return a portion of inventory, receive credits for changes in selling prices, and participate in various cooperative marketing programs. If sales through indirect channels increase, this may lead to greater difficulty in forecasting the mix of our products and, to a degree, the timing of orders from our customers.

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Historically, we have seen fluctuations in our gross margins based on changes in the balance of our distribution channels. Although variability to date has not been significant, there can be no assurance that changes in the balance of our distribution model in future periods would not have an adverse effect on our gross margins and profitability. Some factors could result in disruption of or changes in our distribution model, which could harm our sales and margins, including the following:

- We compete with some of our channel partners, including through our direct sales, which may lead these channel partners to use other suppliers that do not directly sell their own products or otherwise compete with them
- Some of our channel partners may demand that we absorb a greater share of the risks that their customers may ask them to bear
- Some of our channel partners may have insufficient financial resources and may not be able to withstand changes and challenges in business conditions
- Revenue from indirect sales could suffer if our distributors' financial condition or operations weaken

In addition, we depend on our channel partners globally to comply with applicable regulatory requirements. To the extent that they fail to do so, that could have a material adverse effect on our business, operating results, and financial condition. Further, sales of our products outside of agreed territories can result in disruption to our distribution channels.

THE MARKETS IN WHICH WE COMPETE ARE INTENSELY COMPETITIVE, WHICH COULD ADVERSELY AFFECT OUR ACHIEVEMENT OF REVENUE GROWTH

The markets in which we compete are characterized by rapid change, converging technologies, and a migration to networking and communications solutions that offer relative advantages. These market factors represent a competitive threat to us. We compete with numerous vendors in each product category. The overall number of our competitors providing niche product solutions may increase. Also, the identity and composition of competitors may change as we increase our activity in newer product areas, and in key priority and growth areas. For example, as products related to network programmability, such as SDN products, become more prevalent, we expect to face increased competition from companies that develop networking products based on commoditized hardware, referred to as "white box" hardware, to the extent customers decide to purchase those product offerings instead of ours. In addition, the growth in demand for technology delivered as a service enables new competitors to enter the market.

As we continue to expand globally, we may see new competition in different geographic regions. In particular, we have experienced price-focused competition from competitors in Asia, especially from China, and we anticipate this will continue. Our competitors include Amazon Web Services LLC; Arista Networks, Inc.; ARRIS Group, Inc.; Check Point Software Technologies Ltd.; Dell Technologies Inc.; Extreme Networks, Inc.; F5 Networks, Inc.; FireEye, Inc.; Fortinet, Inc.; Hewlett-Packard Enterprise Company; Huawei Technologies Co., Ltd.; Juniper Networks, Inc.; Lenovo Group Limited; Microsoft Corporation; New Relic, Inc.; Nokia Corporation; Nutanix, Inc.; Palo Alto Networks, Inc.; Symantec Corporation; Ubiquiti Networks and VMware, Inc.; among others.

Some of our competitors compete across many of our product lines, while others are primarily focused in a specific product area. Barriers to entry are relatively low, and new ventures to create products that do or could compete with our products are regularly formed. In addition, some of our competitors may have greater resources, including technical and engineering resources, than we do. As we expand into new markets, we will face competition not only from our existing competitors but also from other competitors, including existing companies with strong technological, marketing, and sales positions in those markets. We also sometimes face competition from resellers and distributors of our products. Companies with which we have strategic alliances in some areas may be competitors in other areas, and in our view this trend may increase.

For example, the enterprise data center is undergoing a fundamental transformation arising from the convergence of technologies, including computing, networking, storage, and software, that previously were segregated. Due to several factors, including the availability of highly scalable and general purpose microprocessors, ASICs offering advanced services, standards based protocols, cloud computing and virtualization, the convergence of technologies within the enterprise data center is spanning multiple, previously independent, technology segments. Also, some of our current and potential competitors for enterprise data center business have made acquisitions, or announced new strategic alliances, designed to position them to provide end-to-end technology solutions for the enterprise data center. As a result of all of these developments, we face greater competition in the development and sale of enterprise data center technologies, including competition from entities that are among our long-term strategic alliance partners. Companies that are strategic alliance partners in some areas of our business may acquire or form alliances with our competitors, thereby reducing their business with us.

The principal competitive factors in the markets in which we presently compete and may compete in the future include:

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- The ability to sell successful business outcomes
- The ability to provide a broad range of networking and communications products and services
- Product performance
- Price
- The ability to introduce new products, including providing continuous new customer value and products with price-performance advantages
- The ability to reduce production costs
- The ability to provide value-added features such as security, reliability, and investment protection
- Conformance to standards
- Market presence
- The ability to provide financing
- Disruptive technology shifts and new business models

We also face competition from customers to which we license or supply technology and suppliers from which we transfer technology. The inherent nature of networking requires interoperability. As such, we must cooperate and at the same time compete with many companies. Any inability to effectively manage these complicated relationships with customers, suppliers, and strategic alliance partners could have a material adverse effect on our business, operating results, and financial condition and accordingly affect our chances of success.

OUR INVENTORY MANAGEMENT RELATING TO OUR SALES TO OUR TWO-TIER DISTRIBUTION CHANNEL IS COMPLEX, AND EXCESS INVENTORY MAY HARM OUR GROSS MARGINS

We must manage our inventory relating to sales to our distributors effectively, because inventory held by them could affect our results of operations. Our distributors may increase orders during periods of product shortages, cancel orders if their inventory is too high, or delay orders in anticipation of new products. They also may adjust their orders in response to the supply of our products and the products of our competitors that are available to them, and in response to seasonal fluctuations in end-user demand. Our distributors are generally given business terms that allow them to return a portion of inventory, receive credits for changes in selling price, and participate in various cooperative marketing programs. Inventory management remains an area of focus as we balance the need to maintain strategic inventory levels to ensure competitive lead times against the risk of inventory obsolescence because of rapidly changing technology and customer requirements. When facing component supply-related challenges, we have increased our efforts in procuring components in order to meet customer expectations. If we ultimately determine that we have excess inventory, we may have to reduce our prices and write down inventory, which in turn could result in lower gross margins.

SUPPLY CHAIN ISSUES, INCLUDING FINANCIAL PROBLEMS OF CONTRACT MANUFACTURERS OR COMPONENT SUPPLIERS, OR A SHORTAGE OF ADEQUATE COMPONENT SUPPLY OR MANUFACTURING CAPACITY THAT INCREASED OUR COSTS OR CAUSED A DELAY IN OUR ABILITY TO FULFILL ORDERS, COULD HAVE AN ADVERSE IMPACT ON OUR BUSINESS AND OPERATING RESULTS, AND OUR FAILURE TO ESTIMATE CUSTOMER DEMAND PROPERLY MAY RESULT IN EXCESS OR OBSOLETE COMPONENT SUPPLY, WHICH COULD ADVERSELY AFFECT OUR GROSS MARGINS

The fact that we do not own or operate the bulk of our manufacturing facilities and that we are reliant on our extended supply chain could have an adverse impact on the supply of our products and on our business and operating results:

- Any financial problems of either contract manufacturers or component suppliers could either limit supply or increase costs
- Reservation of manufacturing capacity at our contract manufacturers by other companies, inside or outside of our industry, could either limit supply or increase costs

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- Industry consolidation occurring within one or more component supplier markets, such as the semiconductor market, could either limit supply or increase costs

A reduction or interruption in supply; a significant increase in the price of one or more components; a failure to adequately authorize procurement of inventory by our contract manufacturers; a failure to appropriately cancel, reschedule, or adjust our requirements based on our business needs; or a decrease in demand for our products could materially adversely affect our business, operating results, and financial condition and could materially damage customer relationships. Furthermore, as a result of binding price or purchase commitments with suppliers, we may be obligated to purchase components at prices that are higher than those available in the current market. In the event that we become committed to purchase components at prices in excess of the current market price when the components are actually used, our gross margins could decrease. We have experienced longer than normal lead times in the past. Although we have generally secured additional supply or taken other mitigation actions when significant disruptions have occurred, if similar situations occur in the future, they could have a material adverse effect on our business, results of operations, and financial condition. See the risk factor above entitled “Our revenue for a particular period is difficult to predict, and a shortfall in revenue may harm our operating results.”

Our growth and ability to meet customer demands depend in part on our ability to obtain timely deliveries of parts from our suppliers and contract manufacturers. We have experienced component shortages in the past, including shortages caused by manufacturing process issues, that have affected our operations. We may in the future experience a shortage of certain component parts as a result of our own manufacturing issues, manufacturing issues at our suppliers or contract manufacturers, capacity problems experienced by our suppliers or contract manufacturers including capacity or cost problems resulting from industry consolidation, or strong demand in the industry for those parts. Growth in the economy is likely to create greater pressures on us and our suppliers to accurately project overall component demand and component demands within specific product categories and to establish optimal component levels and manufacturing capacity, especially for labor-intensive components, components for which we purchase a substantial portion of the supply, or the re-ramping of manufacturing capacity for highly complex products. During periods of shortages or delays the price of components may increase, or the components may not be available at all, and we may also encounter shortages if we do not accurately anticipate our needs. We may not be able to secure enough components at reasonable prices or of acceptable quality to build new products in a timely manner in the quantities or configurations needed. Accordingly, our revenue and gross margins could suffer until other sources can be developed. Our operating results would also be adversely affected if, anticipating greater demand than actually develops, we commit to the purchase of more components than we need, which is more likely to occur in a period of demand uncertainties such as we are currently experiencing. There can be no assurance that we will not encounter these problems in the future. Although in many cases we use standard parts and components for our products, certain components are presently available only from a single source or limited sources, and a global economic downturn and related market uncertainty could negatively impact the availability of components from one or more of these sources, especially during times such as we have recently seen when there are supplier constraints based on labor and other actions taken during economic downturns. We may not be able to diversify sources in a timely manner, which could harm our ability to deliver products to customers and seriously impact present and future sales.

We believe that we may be faced with the following challenges in the future:

- New markets in which we participate may grow quickly, which may make it difficult to quickly obtain significant component capacity
- As we acquire companies and new technologies, we may be dependent, at least initially, on unfamiliar supply chains or relatively small supply partners
- We face competition for certain components that are supply-constrained, from existing competitors, and companies in other markets

Manufacturing capacity and component supply constraints could continue to be significant issues for us. We purchase components from a variety of suppliers and use several contract manufacturers to provide manufacturing services for our products. During the normal course of business, in order to improve manufacturing lead-time performance and to help ensure adequate component supply, we enter into agreements with contract manufacturers and suppliers that either allow them to procure inventory based upon criteria as defined by us or that establish the parameters defining our requirements. In certain instances, these agreements allow us the option to cancel, reschedule, and adjust our requirements based on our business needs prior to firm orders being placed. When facing component supply-related challenges we have increased our efforts in procuring components in order to meet customer expectations, which in turn contributes to an increase in purchase commitments. Increases in our purchase commitments to shorten lead times could also lead to excess and obsolete inventory charges if the demand for our products is less than our expectations. If we fail to anticipate customer demand properly, an oversupply of parts could result in excess or obsolete components that could adversely affect our gross margins. For additional information regarding our purchase commitments with contract manufacturers and suppliers, see Note 13 to the Consolidated Financial Statements.

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WE DEPEND UPON THE DEVELOPMENT OF NEW PRODUCTS AND ENHANCEMENTS TO EXISTING PRODUCTS, AND IF WE FAIL TO PREDICT AND RESPOND TO EMERGING TECHNOLOGICAL TRENDS AND CUSTOMERS' CHANGING NEEDS, OUR OPERATING RESULTS AND MARKET SHARE MAY SUFFER

The markets for our products are characterized by rapidly changing technology, evolving industry standards, new product introductions, and evolving methods of building and operating networks. Our operating results depend on our ability to develop and introduce new products into existing and emerging markets and to reduce the production costs of existing products. Many of our strategic initiatives and investments we have made, and our architectural approach, are designed to enable the increased use of the network as the platform for automating, orchestrating, integrating, and delivering an ever-increasing array of IT-based products and services. For example, in June 2017 we announced our Catalyst 9000 series of switches which represent the initial foundation of our intent-based networking capabilities. Other current initiatives include our focus on security; the market transition related to digital transformation and IoT; the transition in cloud; and the move towards more programmable, flexible and virtual networks.

The process of developing new technology, including intent-based networking, more programmable, flexible and virtual networks, and technology related to other market transitions— such as security, digital transformation and IoT, and cloud— is complex and uncertain, and if we fail to accurately predict customers' changing needs and emerging technological trends our business could be harmed. We must commit significant resources, including the investments we have been making in our priorities to developing new products before knowing whether our investments will result in products the market will accept. In particular, if our model of the evolution of networking does not emerge as we believe it will, or if the industry does not evolve as we believe it will, or if our strategy for addressing this evolution is not successful, many of our strategic initiatives and investments may be of no or limited value. For example, if we do not introduce products related to network programmability, such as software-defined-networking products, in a timely fashion, or if product offerings in this market that ultimately succeed are based on technology, or an approach to technology, that differs from ours, such as, for example, networking products based on "white box" hardware, our business could be harmed. Similarly, our business could be harmed if we fail to develop, or fail to develop in a timely fashion, offerings to address other transitions, or if the offerings addressing these other transitions that ultimately succeed are based on technology, or an approach to technology, different from ours. In addition, our business could be adversely affected in periods surrounding our new product introductions if customers delay purchasing decisions to qualify or otherwise evaluate the new product offerings.

Our strategy is to lead our customers in their digital transition with solutions that deliver greater agility, productivity, security and other advanced network capabilities, and that intelligently connect nearly everything that can be connected. Over the last few years, we have been transforming our business to move from selling individual products and services to selling products and services integrated into architectures and solutions, and we are seeking to meet the evolving needs of customers which include offering our products and solutions in the manner in which customers wish to consume them. As a part of this transformation, we continue to make changes to how we are organized and how we build and deliver our technology, including changes in our business models with customers. If our strategy for addressing our customer needs, or the architectures and solutions we develop do not meet those needs, or the changes we are making in how we are organized and how we build and deliver or technology is incorrect or ineffective, our business could be harmed.

Furthermore, we may not execute successfully on our vision or strategy because of challenges with regard to product planning and timing, technical hurdles that we fail to overcome in a timely fashion, or a lack of appropriate resources. This could result in competitors, some of which may also be our strategic alliance partners, providing those solutions before we do and loss of market share, revenue, and earnings. In addition, the growth in demand for technology delivered as a service enables new competitors to enter the market. The success of new products depends on several factors, including proper new product definition, component costs, timely completion and introduction of these products, differentiation of new products from those of our competitors, and market acceptance of these products. There can be no assurance that we will successfully identify new product opportunities, develop and bring new products to market in a timely manner, or achieve market acceptance of our products or that products and technologies developed by others will not render our products or technologies obsolete or noncompetitive. The products and technologies in our other product categories and key priority and growth areas may not prove to have the market success we anticipate, and we may not successfully identify and invest in other emerging or new products.

CHANGES IN INDUSTRY STRUCTURE AND MARKET CONDITIONS COULD LEAD TO CHARGES RELATED TO DISCONTINUANCES OF CERTAIN OF OUR PRODUCTS OR BUSINESSES, ASSET IMPAIRMENTS AND WORKFORCE REDUCTIONS OR RESTRUCTURINGS

In response to changes in industry and market conditions, we may be required to strategically realign our resources and to consider restructuring, disposing of, or otherwise exiting businesses. Any resource realignment, or decision to limit investment in or dispose of or otherwise exit businesses, may result in the recording of special charges, such as inventory and technology-related write-offs, workforce reduction or restructuring costs, charges relating to consolidation of excess facilities, or claims from third parties who were resellers or users of discontinued products. Our estimates with respect to the useful life or ultimate recoverability of our carrying basis of assets, including purchased intangible assets, could change as a result of such assessments and decisions. Although

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in certain instances our supply agreements allow us the option to cancel, reschedule, and adjust our requirements based on our business needs prior to firm orders being placed, our loss contingencies may include liabilities for contracts that we cannot cancel with contract manufacturers and suppliers. Further, our estimates relating to the liabilities for excess facilities are affected by changes in real estate market conditions. Additionally, we are required to perform goodwill impairment tests on an annual basis and between annual tests in certain circumstances, and future goodwill impairment tests may result in a charge to earnings.

We initiated a restructuring plan in the third quarter of fiscal 2018 and expanded it in the first quarter of fiscal 2019. The implementation of this restructuring plan may be disruptive to our business, and following completion of the restructuring plan our business may not be more efficient or effective than prior to implementation of the plan. Our restructuring activities, including any related charges and the impact of the related headcount restructurings, could have a material adverse effect on our business, operating results, and financial condition.

OVER THE LONG TERM WE INTEND TO INVEST IN ENGINEERING, SALES, SERVICE AND MARKETING ACTIVITIES, AND THESE INVESTMENTS MAY ACHIEVE DELAYED, OR LOWER THAN EXPECTED, BENEFITS WHICH COULD HARM OUR OPERATING RESULTS

While we intend to focus on managing our costs and expenses, over the long term, we also intend to invest in personnel and other resources related to our engineering, sales, service and marketing functions as we realign and dedicate resources on key priority and growth areas, such as Security and Applications, and we also intend to focus on maintaining leadership in Infrastructure Platforms and in Services. We are likely to recognize the costs associated with these investments earlier than some of the anticipated benefits, and the return on these investments may be lower, or may develop more slowly, than we expect. If we do not achieve the benefits anticipated from these investments, or if the achievement of these benefits is delayed, our operating results may be adversely affected.

OUR BUSINESS SUBSTANTIALLY DEPENDS UPON THE CONTINUED GROWTH OF THE INTERNET AND INTERNET-BASED SYSTEMS

A substantial portion of our business and revenue depends on growth and evolution of the Internet, including the continued development of the Internet and the anticipated market transitions, and on the deployment of our products by customers who depend on such continued growth and evolution. To the extent that an economic slowdown or uncertainty and related reduction in capital spending adversely affect spending on Internet infrastructure, including spending or investment related to anticipated market transitions, we could experience material harm to our business, operating results, and financial condition.

Because of the rapid introduction of new products and changing customer requirements related to matters such as cost-effectiveness and security, we believe that there could be performance problems with Internet communications in the future, which could receive a high degree of publicity and visibility. Because we are a large supplier of networking products, our business, operating results, and financial condition may be materially adversely affected, regardless of whether or not these problems are due to the performance of our own products. Such an event could also result in a material adverse effect on the market price of our common stock independent of direct effects on our business.

WE HAVE MADE AND EXPECT TO CONTINUE TO MAKE ACQUISITIONS THAT COULD DISRUPT OUR OPERATIONS AND HARM OUR OPERATING RESULTS

Our growth depends upon market growth, our ability to enhance our existing products, and our ability to introduce new products on a timely basis. We intend to continue to address the need to develop new products and enhance existing products through acquisitions of other companies, product lines, technologies, and personnel. Acquisitions involve numerous risks, including the following:

- Difficulties in integrating the operations, systems, technologies, products, and personnel of the acquired companies, particularly companies with large and widespread operations and/or complex products
- Diversion of management's attention from normal daily operations of the business and the challenges of managing larger and more widespread operations resulting from acquisitions
- Potential difficulties in completing projects associated with in-process research and development intangibles
- Difficulties in entering markets in which we have no or limited direct prior experience and where competitors in such markets have stronger market positions
- Initial dependence on unfamiliar supply chains or relatively small supply partners

• Insufficient revenue to offset increased expenses associated with acquisitions

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- The potential loss of key employees, customers, distributors, vendors and other business partners of the companies we acquire following and continuing after announcement of acquisition plans

Acquisitions may also cause us to:

- Issue common stock that would dilute our current shareholders' percentage ownership
- Use a substantial portion of our cash resources, or incur debt
- Significantly increase our interest expense, leverage and debt service requirements if we incur additional debt to pay for an acquisition
- Assume liabilities
- Record goodwill and intangible assets that are subject to impairment testing on a regular basis and potential periodic impairment charges
- Incur amortization expenses related to certain intangible assets
- Incur tax expenses related to the effect of acquisitions on our legal structure
- Incur large and immediate write-offs and restructuring and other related expenses
- Become subject to intellectual property or other litigation

Mergers and acquisitions of high-technology companies are inherently risky and subject to many factors outside of our control, and no assurance can be given that our previous or future acquisitions will be successful and will not materially adversely affect our business, operating results, or financial condition. Failure to manage and successfully integrate acquisitions could materially harm our business and operating results. Prior acquisitions have resulted in a wide range of outcomes, from successful introduction of new products and technologies to a failure to do so. Even when an acquired company has already developed and marketed products, there can be no assurance that product enhancements will be made in a timely fashion or that pre-acquisition due diligence will have identified all possible issues that might arise with respect to such products.

From time to time, we have made acquisitions that resulted in charges in an individual quarter. These charges may occur in any particular quarter, resulting in variability in our quarterly earnings. In addition, our effective tax rate for future periods is uncertain and could be impacted by mergers and acquisitions. Risks related to new product development also apply to acquisitions. See the risk factors above, including the risk factor entitled "We depend upon the development of new products and enhancements to existing products, and if we fail to predict and respond to emerging technological trends and customers' changing needs, our operating results and market share may suffer" for additional information.

ENTRANCE INTO NEW OR DEVELOPING MARKETS EXPOSES US TO ADDITIONAL COMPETITION AND WILL LIKELY INCREASE DEMANDS ON OUR SERVICE AND SUPPORT OPERATIONS

As we focus on new market opportunities and key priority and growth areas, we will increasingly compete with large telecommunications equipment suppliers as well as startup companies. Several of our competitors may have greater resources, including technical and engineering resources, than we do. Additionally, as customers in these markets complete infrastructure deployments, they may require greater levels of service, support, and financing than we have provided in the past, especially in emerging countries. Demand for these types of service, support, or financing contracts may increase in the future. There can be no assurance that we can provide products, service, support, and financing to effectively compete for these market opportunities.

Further, provision of greater levels of services, support and financing by us may result in a delay in the timing of revenue recognition. In addition, entry into other markets has subjected and will subject us to additional risks, particularly to those markets, including the effects of general market conditions and reduced consumer confidence. For example, as we add direct selling capabilities globally to meet changing customer demands, we will face increased legal and regulatory requirements.

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INDUSTRY CONSOLIDATION MAY LEAD TO INCREASED COMPETITION AND MAY HARM OUR OPERATING RESULTS

There has been a trend toward industry consolidation in our markets for several years. We expect this trend to continue as companies attempt to strengthen or hold their market positions in an evolving industry and as companies are acquired or are unable to continue operations. For example, some of our current and potential competitors for enterprise data center business have made acquisitions, or announced new strategic alliances, designed to position them with the ability to provide end-to-end technology solutions for the enterprise data center. Companies that are strategic alliance partners in some areas of our business may acquire or form alliances with our competitors, thereby reducing their business with us. We believe that industry consolidation may result in stronger competitors that are better able to compete as sole-source vendors for customers. This could lead to more variability in our operating results and could have a material adverse effect on our business, operating results, and financial condition. Furthermore, particularly in the service provider market, rapid consolidation will lead to fewer customers, with the effect that loss of a major customer could have a material impact on results not anticipated in a customer marketplace composed of more numerous participants.

PRODUCT QUALITY PROBLEMS COULD LEAD TO REDUCED REVENUE, GROSS MARGINS, AND NET INCOME

We produce highly complex products that incorporate leading-edge technology, including both hardware and software. Software typically contains bugs that can unexpectedly interfere with expected operations. There can be no assurance that our pre-shipment testing programs will be adequate to detect all defects, either ones in individual products or ones that could affect numerous shipments, which might interfere with customer satisfaction, reduce sales opportunities, or affect gross margins. From time to time, we have had to replace certain components and provide remediation in response to the discovery of defects or bugs in products that we had shipped. There can be no assurance that such remediation, depending on the product involved, would not have a material impact. An inability to cure a product defect could result in the failure of a product line, temporary or permanent withdrawal from a product or market, damage to our reputation, inventory costs, or product reengineering expenses, any of which could have a material impact on our revenue, margins, and net income. For example, in the second quarter of fiscal 2017 we recorded a charge to product cost of sales of $125 million related to the expected remediation costs for anticipated failures in future periods of a widely-used component sourced from a third party which is included in several of our products, and in the second quarter of fiscal 2014 we recorded a pre-tax charge of $655 million related to the expected remediation costs for certain products sold in prior fiscal years containing memory components manufactured by a single supplier between 2005 and 2010.

DUE TO THE GLOBAL NATURE OF OUR OPERATIONS, POLITICAL OR ECONOMIC CHANGES OR OTHER FACTORS IN A SPECIFIC COUNTRY OR REGION COULD HARM OUR OPERATING RESULTS AND FINANCIAL CONDITION

We conduct significant sales and customer support operations in countries around the world. As such, our growth depends in part on our increasing sales into emerging countries. We also depend on non-U.S. operations of our contract manufacturers, component suppliers and distribution partners. Our business in emerging countries in the aggregate experienced a decline in orders in certain prior periods. We continue to assess the sustainability of any improvements in our business in these countries and there can be no assurance that our investments in these countries will be successful. Our future results could be materially adversely affected by a variety of political, economic or other factors relating to our operations inside and outside the United States, including impacts from global central bank monetary policy; issues related to the political relationship between the United States and other countries that can affect the willingness of customers in those countries to purchase products from companies headquartered in the United States; government-related disruptions or shutdowns; and the challenging and inconsistent global macroeconomic environment, any or all of which could have a material adverse effect on our operating results and financial condition, including, among others, the following:

- Foreign currency exchange rates
- Political or social unrest

- Economic instability or weakness or natural disasters in a specific country or region, including the current economic challenges in China and global economic ramifications of Chinese economic difficulties; instability as a result of Brexit; environmental protection measures, trade protection measures such as tariffs, and other legal and regulatory requirements, some of which may affect our ability to import our products, to export our products from, or sell our products in various countries
- Political considerations that affect service provider and government spending patterns
- Health or similar issues, such as a pandemic or epidemic

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- Difficulties in staffing and managing international operations
- Adverse tax consequences, including imposition of withholding or other taxes on our global operations

WE ARE EXPOSED TO THE CREDIT RISK OF SOME OF OUR CUSTOMERS AND TO CREDIT EXPOSURES IN WEAKENED MARKETS, WHICH COULD RESULT IN MATERIAL LOSSES

Most of our sales are on an open credit basis, with typical payment terms of 30 days in the United States and, because of local customs or conditions, longer in some markets outside the United States. We monitor individual customer payment capability in granting such open credit arrangements, seek to limit such open credit to amounts we believe the customers can pay, and maintain reserves we believe are adequate to cover exposure for doubtful accounts.

Beyond our open credit arrangements, we have also experienced demands for customer financing and facilitation of leasing arrangements. We expect demand for customer financing to continue, and recently we have been experiencing an increase in this demand as the credit markets have been impacted by the challenging and inconsistent global macroeconomic environment, including increased demand from customers in certain emerging countries.

We believe customer financing is a competitive factor in obtaining business, particularly in serving customers involved in significant infrastructure projects. Our loan financing arrangements may include not only financing the acquisition of our products and services but also providing additional funds for other costs associated with network installation and integration of our products and services.

Our exposure to the credit risks relating to our financing activities described above may increase if our customers are adversely affected by a global economic downturn or periods of economic uncertainty. Although we have programs in place that are designed to monitor and mitigate the associated risk, including monitoring of particular risks in certain geographic areas, there can be no assurance that such programs will be effective in reducing our credit risks.

In the past, there have been significant bankruptcies among customers both on open credit and with loan or lease financing arrangements, particularly among Internet businesses and service providers, causing us to incur economic or financial losses. There can be no assurance that additional losses will not be incurred. Although these losses have not been material to date, future losses, if incurred, could harm our business and have a material adverse effect on our operating results and financial condition. A portion of our sales is derived through our distributors. These distributors are generally given business terms that allow them to return a portion of inventory, receive credits for changes in selling prices, and participate in various cooperative marketing programs. We maintain estimated accruals and allowances for such business terms. However, distributors tend to have more limited financial resources than other resellers and end-user customers and therefore represent potential sources of increased credit risk, because they may be more likely to lack the reserve resources to meet payment obligations. Additionally, to the degree that turmoil in the credit markets makes it more difficult for some customers to obtain financing, those customers' ability to pay could be adversely impacted, which in turn could have a material adverse impact on our business, operating results, and financial condition.

WE ARE EXPOSED TO FLUCTUATIONS IN THE MARKET VALUES OF OUR PORTFOLIO INVESTMENTS AND IN INTEREST RATES; IMPAIRMENT OF OUR INVESTMENTS COULD HARM OUR EARNINGS

We maintain an investment portfolio of various holdings, types, and maturities. Our portfolio includes available-for-sale debt investments and equity investments, the values of which are subject to market price volatility to the extent unhedged. Available-for-sale debt investments are recorded on our Consolidated Balance Sheets at fair value with unrealized gains or losses reported as a component of accumulated other comprehensive income (loss), net of tax. If such investments suffer market price declines, as we experienced with some of our investments in the past, we may recognize in earnings the decline in the fair value of our investments below their cost basis when the decline is judged to be other than temporary. Securities classified as marketable equity are recorded on our Consolidated Balance Sheets at fair value with gains or losses recorded to interest and other income (loss), net. Our non-marketable equity and other investments are subject to risk of loss of investment capital. These investments are inherently risky because the markets for the technologies or products they have under development are typically in the early stages and may never materialize. We could lose our entire investment in these companies. For information regarding the market risks associated with the fair value of portfolio investments and interest rates, refer to the section titled "Quantitative and Qualitative Disclosures About Market Risk."

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WE ARE EXPOSED TO FLUCTUATIONS IN CURRENCY EXCHANGE RATES THAT COULD NEGATIVELY IMPACT OUR FINANCIAL RESULTS AND CASH FLOWS

Because a significant portion of our business is conducted outside the United States, we face exposure to adverse movements in foreign currency exchange rates. These exposures may change over time as business practices evolve, and they could have a material adverse impact on our financial results and cash flows. Historically, our primary exposures have related to nondollar-denominated sales in Japan, Canada, and Australia and certain nondollar-denominated operating expenses and service cost of sales in Europe, Latin America, and Asia, where we sell primarily in U.S. dollars. Additionally, we have exposures to emerging market currencies, which can have extreme currency volatility. An increase in the value of the dollar could increase the real cost to our customers of our products in those markets outside the United States where we sell in dollars and a weakened dollar could increase the cost of local operating expenses and procurement of raw materials to the extent that we must purchase components in foreign currencies.

Currently, we enter into foreign exchange forward contracts and options to reduce the short-term impact of foreign currency fluctuations on certain foreign currency receivables, investments, and payables. In addition, we periodically hedge anticipated foreign currency cash flows. Our attempts to hedge against these risks may result in an adverse impact on our net income.

OUR PROPRIETARY RIGHTS MAY PROVE DIFFICULT TO ENFORCE

We generally rely on patents, copyrights, trademarks, and trade secret laws to establish and maintain proprietary rights in our technology and products. Although we have been issued numerous patents and other patent applications are currently pending, there can be no assurance that any of these patents or other proprietary rights will not be challenged, invalidated, or circumvented or that our rights will, in fact, provide competitive advantages to us. Furthermore, many key aspects of networking technology are governed by industrywide standards, which are usable by all market entrants. In addition, there can be no assurance that patents will be issued from pending applications or that claims allowed on any patents will be sufficiently broad to protect our technology. In addition, the laws of some foreign countries may not protect our proprietary rights to the same extent as do the laws of the United States. The outcome of any actions taken in these foreign countries may be different than if such actions were determined under the laws of the United States. Although we are not dependent on any individual patents or group of patents for particular segments of the business for which we compete, if we are unable to protect our proprietary rights to the totality of the features (including aspects of products protected other than by patent rights) in a market, we may find ourselves at a competitive disadvantage to others who need not incur the substantial expense, time, and effort required to create innovative products that have enabled us to be successful.

WE MAY BE FOUND TO INFRINGE ON INTELLECTUAL PROPERTY RIGHTS OF OTHERS

Third parties, including customers, have in the past and may in the future assert claims or initiate litigation related to exclusive patent, copyright, trademark, and other intellectual property rights to technologies and related standards that are relevant to us. These assertions have increased over time as a result of our growth and the general increase in the pace of patent claims assertions, particularly in the United States. Because of the existence of a large number of patents in the networking field, the secrecy of some pending patents, and the rapid rate of issuance of new patents, it is not economically practical or even possible to determine in advance whether a product or any of its components infringes or will infringe on the patent rights of others. The asserted claims and/or initiated litigation can include claims against us or our manufacturers, suppliers, or customers, alleging infringement of their proprietary rights with respect to our existing or future products or components of those products. Regardless of the merit of these claims, they can be time-consuming, result in costly litigation and diversion of technical and management personnel, or require us to develop a non-infringing technology or enter into license agreements. Where claims are made by customers, resistance even to unmeritorious claims could damage customer relationships. There can be no assurance that licenses will be available on acceptable terms and conditions, if at all, or that our indemnification by our suppliers will be adequate to cover our costs if a claim were brought directly against us or our customers. Furthermore, because of the potential for high court awards that are not necessarily predictable, it is not unusual to find even arguably unmeritorious claims settled for significant amounts. If any infringement or other intellectual property claim made against us by any third party is successful, if we are required to indemnify a customer with respect to a claim against the customer, or if we fail to develop non-infringing technology or license the proprietary rights on commercially reasonable terms and conditions, our business, operating results, and financial condition could be materially and adversely affected. For additional information regarding our indemnification obligations, see Note 13(f) to the Consolidated Financial Statements contained in this report.

Our exposure to risks associated with the use of intellectual property may be increased as a result of acquisitions, as we have a lower level of visibility into the development process with respect to such technology or the care taken to safeguard against infringement risks. Further, in the past, third parties have made infringement and similar claims after we have acquired technology that had not been asserted prior to our acquisition.

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WE RELY ON THE AVAILABILITY OF THIRD-PARTY LICENSES

Many of our products are designed to include software or other intellectual property licensed from third parties. It may be necessary in the future to seek or renew licenses relating to various aspects of these products. There can be no assurance that the necessary licenses would be available on acceptable terms, if at all. The inability to obtain certain licenses or other rights or to obtain such licenses or rights on favorable terms, or the need to engage in litigation regarding these matters, could have a material adverse effect on our business, operating results, and financial condition. Moreover, the inclusion in our products of software or other intellectual property licensed from third parties on a nonexclusive basis could limit our ability to protect our proprietary rights in our products.

OUR OPERATING RESULTS MAY BE ADVERSELY AFFECTED AND DAMAGE TO OUR REPUTATION MAY OCCUR DUE TO PRODUCTION AND SALE OF COUNTERFEIT VERSIONS OF OUR PRODUCTS

As is the case with leading products around the world, our products are subject to efforts by third parties to produce counterfeit versions of our products. While we work diligently with law enforcement authorities in various countries to block the manufacture of counterfeit goods and to interdict their sale, and to detect counterfeit products in customer networks, and have succeeded in prosecuting counterfeiters and their distributors, resulting in fines, imprisonment and restitution to us, there can be no guarantee that such efforts will succeed. While counterfeiters often aim their sales at customers who might not have otherwise purchased our products due to lack of verifiability of origin and service, such counterfeit sales, to the extent they replace otherwise legitimate sales, could adversely affect our operating results.

OUR OPERATING RESULTS AND FUTURE PROSPECTS COULD BE MATERIALLY HARMED BY UNCERTAINTIES OF REGULATION OF THE INTERNET

Currently, few laws or regulations apply directly to access or commerce on the Internet. We could be materially adversely affected by regulation of the Internet and Internet commerce in any country where we operate. Such regulations could include matters such as voice over the Internet or using IP, encryption technology, sales or other taxes on Internet product or service sales, and access charges for Internet service providers. The adoption of regulation of the Internet and Internet commerce could decrease demand for our products and, at the same time, increase the cost of selling our products, which could have a material adverse effect on our business, operating results, and financial condition.

CHANGES IN TELECOMMUNICATIONS REGULATION AND TARIFFS COULD HARM OUR PROSPECTS AND FUTURE SALES

Changes in telecommunications requirements, or regulatory requirements in other industries in which we operate, in the United States or other countries could affect the sales of our products. In particular, we believe that there may be future changes in U.S. telecommunications regulations that could slow the expansion of the service providers’ network infrastructures and materially adversely affect our business, operating results, and financial condition, including "net neutrality" rules to the extent they impact decisions on investment in network infrastructure.

Future changes in tariffs by regulatory agencies or application of tariff requirements to currently untariffed services could affect the sales of our products for certain classes of customers. Additionally, in the United States, our products must comply with various requirements and regulations of the Federal Communications Commission and other regulatory authorities. In countries outside of the United States, our products must meet various requirements of local telecommunications and other industry authorities. Changes in tariffs or failure by us to obtain timely approval of products could have a material adverse effect on our business, operating results, and financial condition.

FAILURE TO RETAIN AND RECRUIT KEY PERSONNEL WOULD HARM OUR ABILITY TO MEET KEY OBJECTIVES

Our success has always depended in large part on our ability to attract and retain highly skilled technical, managerial, sales, and marketing personnel. Competition for these personnel is intense, especially in the Silicon Valley area of Northern California. Stock incentive plans are designed to reward employees for their long-term contributions and provide incentives for them to remain with us. Volatility or lack of positive performance in our stock price or equity incentive awards, or changes to our overall compensation program, including our stock incentive program, resulting from the management of share dilution and share-based compensation expense or otherwise, may also adversely affect our ability to retain key employees. As a result of one or more of these factors, we may increase our hiring in geographic areas outside the United States, which could subject us to additional geopolitical and exchange rate risk. The loss of services of any of our key personnel; the inability to retain and attract qualified personnel in the future; or delays in hiring required personnel, particularly engineering and sales personnel, could make it difficult to meet key objectives, such as timely and effective product introductions. In addition, companies in our industry whose employees accept positions with competitors frequently claim that competitors have engaged in improper hiring practices. We have received these claims in the past and may receive additional claims to this effect in the future.

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ADVERSE RESOLUTION OF LITIGATION OR GOVERNMENTAL INVESTIGATIONS MAY HARM OUR OPERATING RESULTS OR FINANCIAL CONDITION

We are a party to lawsuits in the normal course of our business. Litigation can be expensive, lengthy, and disruptive to normal business operations. Moreover, the results of complex legal proceedings are difficult to predict. For example, Brazilian authorities have investigated our Brazilian subsidiary and certain of its former employees, as well as a Brazilian importer of our products, and its affiliates and employees, relating to alleged evasion of import taxes and alleged improper transactions involving the subsidiary and the importer. Brazilian tax authorities have assessed claims against our Brazilian subsidiary based on a theory of joint liability with the Brazilian importer for import taxes, interest, and penalties. The asserted claims by Brazilian federal tax authorities which remain are for calendar years 2003 through 2007, and the asserted claims by the tax authorities from the state of Sao Paulo are for calendar years 2005 through 2007. The total asserted claims by Brazilian state and federal tax authorities aggregate to $215 million for the alleged evasion of import and other taxes, $1.4 billion for interest, and $1.0 billion for various penalties, all determined using an exchange rate as of January 26, 2019. We have completed a thorough review of the matters and believe the asserted claims against our Brazilian subsidiary are without merit, and we are defending the claims vigorously. While we believe there is no legal basis for the alleged liability, due to the complexities and uncertainty surrounding the judicial process in Brazil and the nature of the claims asserting joint liability with the importer, we are unable to determine the likelihood of an unfavorable outcome against our Brazilian subsidiary and are unable to reasonably estimate a range of loss, if any. We do not expect a final judicial determination for several years. An unfavorable resolution of lawsuits or governmental investigations could have a material adverse effect on our business, operating results, or financial condition. For additional information regarding certain of the matters in which we are involved, see Note 13 to the Consolidated Financial Statements, subsection (g) "Legal Proceedings."

CHANGES IN OUR PROVISION FOR INCOME TAXES OR ADVERSE OUTCOMES RESULTING FROM EXAMINATION OF OUR INCOME TAX RETURNS COULD ADVERSELY AFFECT OUR RESULTS

Our provision for income taxes is subject to volatility and could be adversely affected by earnings being lower than anticipated in countries that have lower tax rates and higher than anticipated in countries that have higher tax rates; by changes in the valuation of our deferred tax assets and liabilities; by changes to domestic manufacturing deduction, foreign-derived intangible income, global intangible low-tax income and base erosion and anti-abuse tax laws, regulations, or interpretations thereof; by expiration of or lapses in tax incentives; by transfer pricing adjustments, including the effect of acquisitions on our legal structure; by tax effects of nondeductible compensation; by tax costs related to intercompany realignments; by changes in accounting principles; or by changes in tax laws and regulations, treaties, or interpretations thereof, including changes to the taxation of earnings of our foreign subsidiaries, the deductibility of expenses attributable to foreign income, and the foreign tax credit rules. Significant judgment is required to determine the recognition and measurement attribute prescribed in the accounting guidance for uncertainty in income taxes. The Organisation for Economic Co-operation and Development (OECD), an international association comprised of 36 countries, including the United States, has made changes to numerous long-standing tax principles. There can be no assurance that these changes, once adopted by countries, will not have an adverse impact on our provision for income taxes. Further, as a result of certain of our ongoing employment and capital investment actions and commitments, our income in certain countries is subject to reduced tax rates. Our failure to meet these commitments could adversely impact our provision for income taxes. In addition, we are subject to the continuous examination of our income tax returns by the Internal Revenue Service and other tax authorities. We regularly assess the likelihood of adverse outcomes resulting from these examinations to determine the adequacy of our provision for income taxes. There can be no assurance that the outcomes from these continuous examinations will not have an adverse effect on our operating results and financial condition.

OUR BUSINESS AND OPERATIONS ARE ESPECIALLY SUBJECT TO THE RISKS OF EARTHQUAKES, FLOODS, AND OTHER NATURAL CATASTROPHIC EVENTS

Our corporate headquarters, including certain of our research and development operations are located in the Silicon Valley area of Northern California, a region known for seismic activity. Additionally, a certain number of our facilities are located near rivers that have experienced flooding in the past. Also certain of our suppliers and logistics centers are located in regions that have been or may be affected by earthquake, tsunami and flooding activity which in the past has disrupted, and in the future could disrupt, the flow of components and delivery of products. A significant natural disaster, such as an earthquake, a hurricane, volcano, or a flood, could have a material adverse impact on our business, operating results, and financial condition.

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CYBER-ATTACKS, DATA BREACHES OR MALWARE MAY DISRUPT OUR OPERATIONS, HARM OUR OPERATING RESULTS AND FINANCIAL CONDITION, AND DAMAGE OUR REPUTATION, AND CYBER-ATTACKS OR DATA BREACHES ON OUR CUSTOMERS' NETWORKS, OR IN CLOUD-BASED SERVICES PROVIDED BY OR ENABLED BY US, COULD RESULT IN CLAIMS OF LIABILITY AGAINST US, DAMAGE OUR REPUTATION OR OTHERWISE HARM OUR BUSINESS

Despite our implementation of security measures, the products and services we sell to customers, and our servers, data centers and the cloud-based solutions on which our data, and data of our customers, suppliers and business partners are stored, are vulnerable to cyber-attacks, data breaches, malware, and similar disruptions from unauthorized access or tampering by malicious actors or inadvertent error. Any such event could compromise our products, services, and networks or those of our customers, and the information stored on our systems or those of our customers could be improperly accessed, processed, disclosed, lost or stolen, which could subject us to liability to our customers, suppliers, business partners and others, give rise to legal/regulatory action, and could have a material adverse effect on our business, operating results, and financial condition and may cause damage to our reputation. Efforts to limit the ability of malicious actors to disrupt the operations of the Internet or undermine our own security efforts may be costly to implement and meet with resistance, and may not be successful. Breaches of security in our customers' networks, or in cloud-based services provided by or enabled by us, regardless of whether the breach is attributable to a vulnerability in our products or services, could result in claims of liability against us, damage our reputation or otherwise harm our business.

VULNERABILITIES AND CRITICAL SECURITY DEFECTS, PRIORITIZATION DECISIONS REGARDING REMEDYING VULNERABILITIES OR SECURITY DEFECTS, FAILURE OF THIRD PARTY PROVIDERS TO REMEDY VULNERABILITIES OR SECURITY DEFECTS, OR CUSTOMERS NOT DEPLOYING SECURITY RELEASES OR DECIDING NOT TO UPGRADE PRODUCTS, SERVICES OR SOLUTIONS COULD RESULT IN CLAIMS OF LIABILITY AGAINST US, DAMAGE OUR REPUTATION OR OTHERWISE HARM OUR BUSINESS

The products and services we sell to customers, and our cloud-based solutions, inevitably contain vulnerabilities or critical security defects which have not been remedied and cannot be disclosed without compromising security. We may also make prioritization decisions in determining which vulnerabilities or security defects to fix, and the timing of these fixes, which could result in an exploit which compromises security. Customers also need to test security releases before they can be deployed which can delay implementation. In addition, we rely on third-party providers of software and cloud-based service and we cannot control the rate at which they remedy vulnerabilities. Customers may also not deploy a security release, or decide not to upgrade to the latest versions of our products, services or cloud-based solutions containing the release, leaving them vulnerable. Vulnerabilities and critical security defects, prioritization errors in remedying vulnerabilities or security defects, failure of third-party providers to remedy vulnerabilities or security defects, or customers not deploying security releases or deciding not to upgrade products, services or solutions could result in claims of liability against us, damage our reputation or otherwise harm our business.

TERRORISM AND OTHER EVENTS MAY HARM OUR BUSINESS, OPERATING RESULTS AND FINANCIAL CONDITION

The continued threat of terrorism and heightened security and military action in response to this threat, or any future acts of terrorism, may cause further disruptions to the economies of the United States and other countries and create further uncertainties or otherwise materially harm our business, operating results, and financial condition. Likewise, events such as loss of infrastructure and utilities services such as energy, transportation, or telecommunications could have similar negative impacts. To the extent that such disruptions or uncertainties result in delays or cancellations of customer orders or the manufacture or shipment of our products, our business, operating results, and financial condition could be materially and adversely affected.

IF WE DO NOT SUCCESSFULLY MANAGE OUR STRATEGIC ALLIANCES, WE MAY NOT REALIZE THE EXPECTED BENEFITS FROM SUCH ALLIANCES AND WE MAY EXPERIENCE INCREASED COMPETITION OR DELAYS IN PRODUCT DEVELOPMENT

We have several strategic alliances with large and complex organizations and other companies with which we work to offer complementary products and services and in the past have established a joint venture to market services associated with our Cisco Unified Computing System products. These arrangements are generally limited to specific projects, the goal of which is generally to facilitate product compatibility and adoption of industry standards. There can be no assurance we will realize the expected benefits from these strategic alliances or from the joint venture. If successful, these relationships may be mutually beneficial and result in industry growth. However, alliances carry an element of risk because, in most cases, we must compete in some business areas with a company with which we have a strategic alliance and, at the same time, cooperate with that company in other business areas. Also, if these companies fail to perform or if these relationships fail to materialize as expected, we could suffer delays in product development or other operational difficulties. Joint ventures can be difficult to manage, given the potentially different interests of joint venture partners.

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OUR STOCK PRICE MAY BE VOLATILE

Historically, our common stock has experienced substantial price volatility, particularly as a result of variations between our actual financial results and the published expectations of analysts and as a result of announcements by our competitors and us. Furthermore, speculation in the press or investment community about our strategic position, financial condition, results of operations, business, security of our products, or significant transactions can cause changes in our stock price. In addition, the stock market has experienced extreme price and volume fluctuations that have affected the market price of many technology companies, in particular, and that have often been unrelated to the operating performance of these companies. These factors, as well as general economic and political conditions and the announcement of proposed and completed acquisitions or other significant transactions, or any difficulties associated with such transactions, by us or our current or potential competitors, may materially adversely affect the market price of our common stock in the future. Additionally, volatility, lack of positive performance in our stock price or changes to our overall compensation program, including our stock incentive program, may adversely affect our ability to retain key employees, virtually all of whom are compensated, in part, based on the performance of our stock price.

THERE CAN BE NO ASSURANCE THAT OUR OPERATING RESULTS AND FINANCIAL CONDITION WILL NOT BE ADVERSELY AFFECTED BY OUR INCURRENCE OF DEBT

As of the end of the second quarter of fiscal 2019, we have senior unsecured notes outstanding in an aggregate principal amount of $25.8 billion that mature at specific dates from calendar year 2019 through 2040. We have also established a commercial paper program under which we may issue short-term, unsecured commercial paper notes on a private placement basis up to a maximum aggregate amount outstanding at any time of $10.0 billion, we had no commercial paper notes outstanding under this program as of January 26, 2019, and as of February 18, 2019, we had approximately $2 billion of commercial paper notes outstanding. The outstanding senior unsecured notes bear fixed-rate interest payable semiannually, except $1.0 billion of the notes which bears interest at a floating rate payable quarterly. The fair value of the long-term debt is subject to market interest rate volatility. The instruments governing the senior unsecured notes contain certain covenants applicable to us and our wholly-owned subsidiaries that may adversely affect our ability to incur certain liens or engage in certain types of sale and leaseback transactions. In addition, we will be required to have available in the United States sufficient cash to service the interest on our debt and repay all of our notes on maturity. There can be no assurance that our incurrence of this debt or any future debt will be a better means of providing liquidity to us than would our use of our existing cash resources. Further, we cannot be assured that our maintenance of this indebtedness or incurrence of future indebtedness will not adversely affect our operating results or financial condition. In addition, changes by any rating agency to our credit rating can negatively impact the value and liquidity of both our debt and equity securities, as well as the terms upon which we may borrow under our commercial paper program or future debt issuances.

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Item 2. Unregistered Sales of Equity Securities and Use of Proceeds
(a) None.
(b) None.
(c) Issuer Purchases of Equity Securities (in millions, except per-share amounts):

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs
October 28, 2018 to November 24, 2018	37	$ 45.76	37	$ 12,325
November 25, 2018 to December 22, 2018	36	$ 46.13	36	$ 10,674
December 23, 2018 to January 26, 2019	38	$ 43.49	38	$ 8,994
Total	111	$ 45.09	111	

On September 13, 2001, we announced that our Board of Directors had authorized a stock repurchase program. On February 13, 2019, our Board of Directors authorized a $15 billion increase to the stock repurchase program. The remaining authorized amount for stock repurchases under this program, including the additional authorization, is approximately $24 billion, with no termination date.

For the majority of restricted stock units granted, the number of shares issued on the date the restricted stock units vest is net of shares withheld to meet applicable tax withholding requirements. Although these withheld shares are not issued or considered common stock repurchases under our stock repurchase program and therefore are not included in the preceding table, they are treated as common stock repurchases in our financial statements as they reduce the number of shares that would have been issued upon vesting (see Note 14 to the Consolidated Financial Statements).

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

None.

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Item 6. Exhibits

The following documents are filed as exhibits to this report:

Exhibit Number	Exhibit Description	Incorporated by Reference				Filed Herewith
		Form	File No.	Exhibit	Filing Date	
10.1	Cisco Systems, Inc. Employee Stock Purchase Plan	8-K	000-18225	10.1	12/13/2018	
10.2	Cisco Systems, Inc. Deferred Compensation Plan, as amended					X
31.1	Rule 13a-14(a)/15d-14(a) Certification of Principal Executive Officer					X
31.2	Rule 13a-14(a)/15d-14(a) Certification of Principal Financial Officer					X
32.1	Section 1350 Certification of Principal Executive Officer					X
32.2	Section 1350 Certification of Principal Financial Officer					X
101.INS	XBRL Instance Document					X
101.SCH	XBRL Taxonomy Extension Schema Document					X
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document					X

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Pursuant to the requirements 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.

	Cisco Systems, Inc.
Date: February 19, 2019	By: /S/ Kelly A. Kramer
	Kelly A. Kramer
	Executive Vice President and
	Chief Financial Officer
	(Principal Financial Officer and duly authorized signatory)