ABIOMED INC
Form 10-Q
February 05, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 or 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to

Commission file number 001-09585

ABIOMED, INC.

(Exact name of registrant as specified in its charter)

DELAWARE	04-2743260
(State or other jurisdiction of incorporation or organization)	(IRS Employer Identification No.)

22 CHERRY HILL DRIVE

DANVERS, MASSACHUSETTS 01923

(Address of principal executive offices, including zip code)

(978) 646-1400

(Registrant's telephone number, including area code)

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

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

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

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

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

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

As of January 31, 2019, 45,085,806 shares of the registrant's common stock, $.01 par value, were outstanding.

ABIOMED, INC. AND SUBSIDIARIES

TABLE OF CONTENTS

		Page
PART I - FINANCIAL INFORMATION:		
Item 1.	Condensed Consolidated Financial Statements (unaudited)	3
	Condensed Consolidated Balance Sheets as of December 31, 2018 and March 31, 2018	3
	Condensed Consolidated Statements of Operations for the three and nine months ended December 31, 2018 and 2017	4
	Condensed Consolidated Statements of Comprehensive Income for the three and nine months ended December 31, 2018 and 2017	5
	Condensed Consolidated Statements of Cash Flows for the nine months ended December 31, 2018 and 2017	6
	Notes to Condensed Consolidated Financial Statements (unaudited)	7
Item 2.	Management's Discussion and Analysis of Financial Condition and Results of Operations	22
Item 3.	Quantitative and Qualitative Disclosures About Market Risk	31
Item 4.	Controls and Procedures	31
PART II - OTHER INFORMATION:		
Item 1.	Legal Proceedings	32
Item 1A.	Risk Factors	32
Item 2.	Unregistered Sales of Equity Securities and Use of Proceeds	32
Item 3.	Defaults Upon Senior Securities	32
Item 4.	Mine Safety Disclosures	32
Item 5.	Other Information	32
Item 6.	Exhibits	33
SIGNATURES		34

NOTE REGARDING COMPANY REFERENCES

Throughout this report on Form 10-Q (the “Report”), “ABIOMED, Inc.,” the “Company,” “we,” “us” and “our” refer to ABIOMED, Inc. and its consolidated subsidiaries.

NOTE REGARDING TRADEMARKS

ABIOMED, IMPELLA, IMPELLA 2.5, IMPELLA 5.0, IMPELLA LD, IMPELLA CP and IMPELLA RP, are trademarks of ABIOMED, Inc., and are registered in the U.S. and certain foreign countries. IMPELLA BTR, IMPELLA 5.5, IMPELLA ECP and cVAD REGISTRY are trademarks of ABIOMED, Inc.

PART 1. FINANCIAL INFORMATION

ITEM 1: FINANCIAL STATEMENTS
ABIOMED, INC. AND SUBSIDIARIES

CONDENSED CONSOLIDATED BALANCE SHEETS

(Unaudited)

(in thousands, except share data)

	December 31, 2018	March 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$84,181	$42,975
Short-term marketable securities	373,975	319,274
Accounts receivable, net	88,215	70,010
Inventories	71,808	50,204
Prepaid expenses and other current assets	10,549	11,808
Total current assets	628,728	494,271
Long-term marketable securities	—	37,502
Property and equipment, net	138,455	117,167
Goodwill	33,260	35,808
In-process research and development	15,516	16,705
Long-term deferred tax assets, net	96,450	70,746
Other assets	44,707	14,176
Total assets	$957,116	$786,375
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$26,179	$23,565
Accrued expenses	51,721	46,147
Deferred revenue	15,080	14,970
Total current liabilities	92,980	84,682
Other long-term liabilities	1,185	776
Contingent consideration	10,583	10,490
Long-term deferred tax liabilities	838	903
Total liabilities	105,586	96,851
Commitments and contingencies (Note 11)		
Stockholders' equity:		
Class B Preferred Stock, $.01 par value	—	—
Authorized - 1,000,000 shares; Issued and outstanding - none		
Common stock, $.01 par value	451	444
Authorized - 100,000,000 shares; Issued - 46,959,653 shares at December 31, 2018 and 46,100,649 shares at March 31, 2018		
Outstanding - 45,058,049 shares at December 31, 2018 and 44,375,337 shares		

at March 31, 2018		
Additional paid in capital	676,171	619,905
Retained earnings	325,513	140,457
Treasury stock at cost - 1,901,604 shares at December 31, 2018 and 1,725,312 shares at March 31, 2018	(138,289)	(67,078)
Accumulated other comprehensive loss	(12,316)	(4,204)
Total stockholders' equity	851,530	689,524
Total liabilities and stockholders' equity	$957,116	$786,375

The accompanying notes are an integral part of the condensed consolidated financial statements (unaudited)

ABIOMED, INC. AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

(Unaudited)

(in thousands, except per share data)

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Revenue	$ 200,563	$ 154,022	$ 562,351	$ 419,313
Costs and expenses:				
Cost of revenue	34,023	24,994	94,718	68,483
Research and development	23,965	17,706	67,955	54,027
Selling, general and administrative	80,220	66,556	240,254	187,233
	138,208	109,256	402,927	309,743
Income from operations	62,355	44,766	159,424	109,570
Other income:				
Investment income, net	2,175	969	5,397	2,385
Other (expense) income, net	(20)	(81)	10	(25)
	2,155	888	5,407	2,360
Income before income taxes	64,510	45,654	164,831	111,930
Income tax provision (benefit)	19,648	32,208	(20,225)	36,607
Net income	$ 44,862	$ 13,446	$ 185,056	$ 75,323
Basic net income per share	$ 1.00	$ 0.30	$ 4.13	$ 1.71
Basic weighted average shares outstanding	45,046	44,247	44,852	44,095
Diluted net income per share	$ 0.97	$ 0.29	$ 4.01	$ 1.65
Diluted weighted average shares outstanding	46,136	45,869	46,147	45,731

The accompanying notes are an integral part of the condensed consolidated financial statements (unaudited)

ABIOMED, INC. AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

(Unaudited)

(in thousands)

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Net income	$44,862	$13,446	$185,056	$75,323
Other comprehensive (loss) gain:				
Foreign currency translation (losses) gains	(1,015)	1,557	(8,468)	10,406
Net unrealized gains (losses) on marketable securities	234	(401)	356	(446)
Other comprehensive (loss) gain	(781)	1,156	(8,112)	9,960
Comprehensive income	$44,081	$14,602	$176,944	$85,283

The accompanying notes are an integral part of the condensed consolidated financial statements (unaudited)

ABIOMED, INC. AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS

(Unaudited)

(in thousands)

	For the Nine Months Ended December 31,	
	2018	2017
Operating activities:		
Net income	$185,056	$75,323
Adjustments required to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization expense	9,936	8,100
Bad debt expense (recovery)	578	(8)
Stock-based compensation	43,757	29,170
Write-down of inventory and other	3,152	3,212
Accretion on marketable securities	(1,644)	—
Deferred tax provision	(25,992)	34,740
Change in fair value of contingent consideration	93	1,270
Changes in assets and liabilities:		
Accounts receivable	(19,268)	(10,342)
Inventories	(26,522)	(11,974)
Prepaid expenses and other assets	678	(1,033)
Accounts payable	4,909	2,595
Accrued expenses and other liabilities	6,909	3,874
Deferred revenue	164	1,220
Net cash provided by operating activities	181,806	136,147
Investing activities:		
Purchases of marketable securities	(241,745)	(209,834)
Proceeds from the sale and maturity of marketable securities	226,949	148,095
Purchase of other assets	(30,436)	(6,400)
Purchases of property and equipment	(35,469)	(44,168)
Net cash used for investing activities	(80,701)	(112,307)
Financing activities:		
Proceeds from the exercise of stock options	11,043	7,626
Taxes paid related to net share settlement of vesting of stock awards	(71,213)	(19,860)
Proceeds from the issuance of stock under employee stock purchase plan	1,376	1,063
Principal payments on capital lease obligation	—	(517)
Net cash used for financing activities	(58,794)	(11,688)
Effect of exchange rate changes on cash	(1,105)	(690)
Net increase in cash and cash equivalents	41,206	11,462
Cash and cash equivalents at beginning of period	42,975	39,040
Cash and cash equivalents at end of period	$84,181	$50,502

Supplemental disclosure of cash flow information:		
Cash paid for income taxes	$4,500	$845
Cash paid for interest on capital lease obligation	—	302
Supplemental disclosure of non-cash investing and financing activities:		
Property and equipment in accounts payable and accrued expenses	1,670	3,836

The accompanying notes are an integral part of the condensed consolidated financial statements (unaudited)

ABIOMED, INC. AND SUBSIDIARIES

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)

(In thousands, except share data)

Note 1. Nature of Business

ABIOMED, Inc. (the "Company" or "Abiomed") is a provider of mechanical circulatory support devices and offers a continuum of care to heart failure patients. The Company develops, manufactures and markets proprietary products that are designed to enable the heart to rest, heal and recover by improving blood flow and/or performing the pumping function of the heart. The Company's products are used in the cardiac catheterization lab, or cath lab, by interventional cardiologists and in the heart surgery suite by cardiac surgeons for patients who are in need of hemodynamic support prophylactically or emergently before, during or after angioplasty or heart surgery procedures.

Note 2. Basis of Preparation and Summary of Significant Accounting Policies

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles, or GAAP, for interim financial reporting and in accordance with Article 10 of Regulation S-X. Accordingly, they do not include all of the information and note disclosures required by GAAP for complete financial statements. These statements should be read in conjunction with the consolidated financial statements and notes thereto included in the Company's Annual Report on Form 10-K for the fiscal year ended March 31, 2018 that has been filed with the Securities and Exchange Commission ("SEC").

In the opinion of management, the accompanying unaudited condensed consolidated financial statements include all normal and recurring adjustments that are necessary for a fair presentation of results for the interim periods presented. The results of operations for any interim period may not be indicative of results for the full fiscal year or any other subsequent period.

There have been no changes in the Company's significant accounting policies for the three and nine months ended December 31, 2018 as compared to the significant accounting policies described in the Company's Annual Report on Form 10-K for the fiscal year ended March 31, 2018 that has been filed with the SEC.

New Accounting Pronouncements Adopted

Effective April 1, 2018, the Company adopted the Financial Accounting Standards Board ("FASB") standard update ASU 2014-09, "Revenue from Contracts with Customers," ("Topic 606") which provides a principles-based, five-step approach to measure and recognize revenue from contracts with customers. The adoption of this guidance did not have a material impact on the Company's consolidated statement of operations, cash flows, and balance sheet as of the adoption date or for the three or nine months ended December 31, 2018. Additional information and disclosures required by this new standard are contained in "Note 4. Revenue Recognition," to the Company's consolidated financial statements.

Effective April 1, 2018, the Company adopted the FASB standard update ASU 2016-01, "Recognition and Measurement of Financial Assets and Financial Liabilities," which requires certain financial assets to be measured at

fair value with changes in fair value recognized in the statement of operations. The adoption of this guidance did not have a material impact on the Company's consolidated statement of operations, cash flows, and balance sheet as of the adoption date or for the three or nine months ended December 31, 2018. Additional information and disclosures required by this new standard are contained in "Note 5. Cash Equivalents, Marketable Securities, and Fair Value Measurements," to the Company's consolidated financial statements.

On June 20, 2018, the FASB issued ASU 2018-07, "Compensation – Stock Compensation ("Topic 718"): Improvements to Nonemployee Share-Based Payment Accounting," which simplifies the accounting for share-based payments granted to nonemployees for goods and services. ASU 2018-07 eliminated the previous guidance for accounting for share-based payments to nonemployees and expanded Topic 718 to include share-based payments transactions to nonemployees. ASU 2018-07 is effective for public companies for fiscal years beginning after December 15, 2018, including interim periods within that fiscal year. Early adoption is permitted, but no earlier than an entity's adoption date of Topic 606. The adoption of ASU 2018-07 requires a modified retrospective transition approach, with a cumulative-effect adjustment to retained earnings as of the beginning of the fiscal year. The Company early adopted ASU 2018-07 on June 20, 2018. The adoption of this guidance did not have a material impact on the Company's consolidated statements of operations, cash flows, and balance sheet as of the adoption date or for the three or nine months ended December 31, 2018.

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU 2016-02, “Leases.” The new guidance significantly impacts lessee accounting and financial statement disclosures. Specifically, this guidance requires lessees to identify arrangements that should be accounted for as leases. Under this guidance, for lease arrangements exceeding a one year term, a right-of-use asset and lease obligation is recorded by the lessee for all leases on the balance sheet, whether operating or financing, while the statement of operations includes lease expense for operating leases and amortization and interest expense for financing leases. The lease obligation amount recorded on the balance sheet at the date of adoption of this guidance must be calculated using the applicable incremental borrowing rate at the date of adoption. Leases with a term of one year or less will be accounted for similar to existing guidance for operating leases. The Company is currently in the process of evaluating its lease arrangements to determine the impact of ASU 2016-02 on its consolidated financial statements as well as updating processes and controls in order to adopt the new standard. This evaluation includes a review of the Company’s existing leasing arrangements on its facilities. In addition, the evaluation includes a review of the Company’s existing contracts with its suppliers and vendors to determine if these agreements contain an embedded lease. The Company currently expects that its lease commitments will be recognized as operating lease liabilities and right-of-use assets upon adoption, which will increase total assets and total liabilities that the Company reports on its consolidated balance sheet. ASU 2016-02 must be adopted using a modified retrospective approach for all leases existing at, or entered into after the date of initial adoption, with an option to elect to use certain transition relief. ASU 2016-02 will become effective for the Company on April 1, 2019.

Note 3. Net Income Per Share

Basic net income per share is computed by dividing net income by the weighted average number of common shares outstanding during the period. Diluted net income per share is computed by dividing net income by the weighted average number of dilutive common shares outstanding during the period. Diluted shares outstanding are calculated by adding to the weighted average shares outstanding any potential dilutive securities outstanding for the period. Potential dilutive securities include stock options, restricted stock units, performance-based stock awards and shares to be purchased under the Company’s employee stock purchase plan. The Company’s basic and diluted net income per share for the three and nine months ended December 31, 2018 and 2017 were as follows (in thousands, except per share data):

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Basic Net Income Per Share				
Net income	$ 44,862	$ 13,446	$ 185,056	$ 75,323
Basic weighted average shares outstanding	45,046	44,247	44,852	44,095
Basic net income per share	$ 1.00	$ 0.30	$ 4.13	$ 1.71

	For the Three Months Ended	For the Nine Months Ended December 31,

	December 31,			
	2018	2017	2018	2017
Diluted Net Income Per Share				
Net income	$ 44,862	$ 13,446	$ 185,056	$ 75,323
Basic weighted average shares outstanding	45,046	44,247	44,852	44,095
Effect of dilutive securities	1,090	1,622	1,295	1,636
Diluted weighted average shares outstanding	46,136	45,869	46,147	45,731
Diluted net income per share	$ 0.97	$ 0.29	$ 4.01	$ 1.65

For the three and nine months ended December 31, 2018, approximately 73,700 and 60,700 shares underlying out-of-the-money stock options, respectively, were excluded in the computation of diluted earnings per share because their effect would have been anti-dilutive. Also, approximately 104,000 restricted shares in each of the three and nine months ended December 31, 2018, respectively, related to performance-based awards for which milestones have not been met, were not included in the computation of diluted earnings per share.

For the three and nine months ended December 31, 2017, approximately 2,600 and 4,800 shares underlying out-of-the-money stock options, respectively, were excluded in the computation of diluted earnings per share because their effect would have been anti-dilutive. Also, approximately 185,000 restricted shares in each of the three and nine months ended December 31, 2017, respectively, related to performance-based and market-based awards for which milestones have not been met, were not included in the computation of diluted earnings per share.

Note 4. Revenue Recognition

Adoption of Topic 606, Revenue from Contracts with Customers

The Company adopted Topic 606 on April 1, 2018, using the modified retrospective method for all contracts not completed as of the date of adoption. The reported results for fiscal year 2019 reflect the application of Topic 606 guidance while the reported results for fiscal year 2018 were prepared under the guidance of ASC 605, “Revenue Recognition.” The adoption of Topic 606 did not have a material impact on the timing or amount of revenue recognized upon adoption and there was no cumulative prior period adjustment recorded to the opening balance of retained earnings upon adoption. Accordingly, the adoption of Topic 606 did not have a material impact on the Company’s consolidated balance sheet, statement of operations, stockholders’ equity or cash flows as of the adoption date or for the three or nine months ended December 31, 2018.

The Company has made the following accounting policy elections and elected to use certain practical expedients, as permitted by the FASB, in applying Topic 606: (1) the Company accounts for amounts collected from customers for sales and other taxes, net of related amounts remitted to tax authorities; (2) the Company does not adjust the promised amount of consideration for the effects of a significant financing component because, at contract inception, the Company expects the period between the time when the Company transfers a promised good or service to the customer and the time when the customer pays for that good or service will be one year or less; (3) the Company expenses costs to obtain a contract as they are incurred if the expected period of benefit, and therefore the amortization period, is one year or less; (4) the Company accounts for shipping and handling activities that occur after control transfers to the customer as a fulfillment cost rather than an additional promised service and these fulfillment costs are recorded as selling, general and administrative expenses; (5) the Company does not assess whether promised goods or services are performance obligations if they are immaterial in the context of the contract with the customer; and (6) the Company does not disclose the transaction price allocated to unsatisfied performance obligations when the original expected contract duration is one year or less.

The Company generates revenue primarily from the sale of Impella 2.5, Impella CP, Impella 5.0, Impella LD, Impella RP and Impella AIC products. The Company also earns revenue from preventative maintenance service contracts and maintenance calls.

The Company determines revenue recognition through the following steps:

- Identification of the contract, or contracts, with a customer
- Identification of the performance obligation in the contract
- Determination of the transaction price
- Allocation of the transaction price to the performance obligation in the contract
- Recognition of revenue when, or as, a performance obligation is satisfied

Contracts and Performance Obligations

The Company accounts for a contract with a customer when there is an approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of the consideration is probable. The Company's performance obligations consist mainly of transferring control of products and services identified in the contracts, purchase orders or invoices. For each contract, the Company considers the obligation to transfer products and services to the customer, each of which are distinct, to be performance obligations.

Transaction price and allocation to performance obligations

Transaction prices of products or services are typically based on contracted rates with customers. To the extent that the transaction price includes variable consideration, the Company estimates the amount of variable consideration that should be included in the transaction price utilizing the expected value method or the most likely amount, depending on the circumstances, to which the Company expects to be entitled. Variable consideration is included in the transaction price if, in the Company's judgment, it is probable that a significant future reversal of cumulative revenue under the contract will not occur. Estimates of variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of the Company's anticipated performance and all information (historical, current and forecasted) that is reasonably available. Sales and other taxes collected on behalf of third parties are excluded from revenue.

The Company does not provide for rights of return to customers on product sales and, therefore, does not record a provision for returns. Customers typically have a limited time frame to notify the Company of any defective or non-conforming products. The Company's limited warranty provision is accounted for using the cost accrual method and is recognized as expense when products are sold and is not considered a separate performance obligation.

If a contract contains a single performance obligation, the entire transaction price is allocated to the single performance obligation. Contracts that contain multiple performance obligations require an allocation of the transaction price based on the estimated relative standalone selling prices of the promised products or services underlying each performance obligation. The Company determines standalone selling prices based on the price at which the performance obligation is sold separately.

Revenue Recognition

Revenue is recognized when, or as, obligations under the terms of a contract are satisfied, which occurs when control of the promised products or services is transferred to customers. Revenue is measured as the amount of consideration the Company expects to receive in exchange for transferring products or services to a customer.

Product revenue is generally recognized when the customer obtains control of the Company's product, which occurs at a point in time, and may be upon shipment or upon delivery based on the contractual shipping terms of a contract.

Service revenue is generally recognized over time as the services are rendered to the customer based on the extent of progress towards completion of the performance obligation. The Company recognizes service revenue over the term of the service contract. Services are expected to be transferred to the customer throughout the term of the contract and the Company believes recognizing revenue ratably over the term of the contract best depicts the transfer of value to the customer. Revenue generated from preventative maintenance calls is recognized at a point in time when the services are provided to the customer.

Revenue from the sale of products and services are evidenced by either a contract with the customer or a valid purchase order and an invoice which includes all relevant terms of sale. The Company performs a review of each specific customer's credit worthiness and ability to pay prior to acceptance as a customer. Further, the Company performs periodic reviews of its customers' creditworthiness prospectively.

Disaggregation of Revenue

The Company generally sells its Impella products and services through a direct sales force in the U.S. and Germany and through direct sales and distribution agreements in other international markets outside (e.g., in Europe, Japan, Canada, Latin America, Asia-Pacific). Revenue is disaggregated from contracts between product revenue and service and other revenue and by geography, which the Company believes best depicts how the nature, amount, timing, and uncertainty of revenues and cash flows are affected by economic factors.

The following table disaggregates the Company's revenue by products and services:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
Impella product revenue	$193,253	$147,989	$542,198	$402,583
Service and other revenue	7,310	6,033	20,153	16,730
Total revenue	$200,563	$154,022	$562,351	$419,313

The following table disaggregates the Company’s revenue by geographical location:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
U.S. revenue	$172,548	$136,363	$488,386	$374,697
International revenue	28,015	17,659	73,965	44,616
Total revenue	$200,563	$154,022	$562,351	$419,313

Reserves for Variable Consideration

Revenues from product sales are recorded at the net sales price (transaction price), which includes estimates of variable consideration for which reserves are established and which result from discounts or rebates that are offered within contracts between the Company and its customers relating to the Company’s sales of its products. These reserves are based on the amounts earned or are expected to be claimed on the related sales and are classified as reductions of accounts receivable. Where appropriate, these estimates take into consideration relevant factors such as the Company’s historical experience, current contractual and statutory requirements,

specific known market events and trends, industry data and forecasted customer buying and payment patterns. These reserves reflect the Company's best estimates of the amount of consideration to which it is entitled based on the terms of the contract. Actual amounts of consideration ultimately received may differ from the Company's estimates. If actual results in the future vary from the Company's estimates, the Company adjusts these estimates, which would affect revenue and earnings in the period such variances become known.

Rebates and Discounts

The Company provides certain customers with rebates and discounts that are defined in the Company's contract arrangements with customers and are recorded as a reduction of revenue in the period the related product revenue is recognized, resulting in a reduction to revenue and the establishment of a liability, which are all included in accrued expenses in the accompanying consolidated balance sheets. Rebates normally result from performance-based offers that are primarily based on attaining contractually specified sales volumes as well as product usage. Discounts are normally from early payment incentives. The Company estimates the amount of rebates and discounts based on an estimate of the third party's sales and the respective rebate or discount defined in the customer contractual arrangement.

The following table summarizes product revenue rebates and discounts for the nine months ended December 31, 2018 (in thousands):

	Rebates and Discounts
Balance at March 31, 2018	$ 1,405
Provision related to current period revenue	1,526
Credits and adjustments made during the period	(1,446)
Balance at December 31, 2018	$ 1,485

Contract Balances

The timing of revenue recognition, billings and cash collections results in accounts receivables and deferred revenue on the consolidated balance sheet. A receivable is recognized in the period the Company's right to the consideration from the customer is unconditional. The change in the accounts receivable balances relate to the timing of revenue recognition, billings and cash collections. The Company generally does not have any performance obligations with a term of more than one year.

Payment terms vary by contract type and type of customer and generally range from 30 to 60 days for direct sales customers. Payment terms with certain international distributors can be up to 90 days. The Company's contracts with customers do not typically include extended payment terms.

Deferred Revenue

When consideration is received, or such consideration is unconditionally due, from a customer prior to transferring goods or services to the customer under the terms of a contract, deferred revenue is recorded. Deferred revenue is recognized as revenue after control of the products or services is transferred to the customer and all revenue recognition criteria have been met.

The Company's deferred revenue balance was $15.1 million and $15.0 million as of December 31, 2018 and March 31, 2018, respectively. The change relates to the timing of product shipment and completion of recognizing revenue when the customer obtains control of the product and additional preventative maintenance service contracts and the subsequent recognition of the contract ratably over the term of the service contract. During the three and nine months ended December 31, 2018, the Company recognized $2.0 million and $14.4 million of revenue that was included in the deferred revenue balance as of March 31, 2018, respectively.

Costs to Obtain or Fulfill a Customer Contract

The Company has certain costs to obtain and fulfill a customer contract, such as commissions and shipping costs. The Company recognizes the incremental costs of obtaining contracts as an expense when incurred if the amortization period of the assets that the Company otherwise would have recognized is one year or less. The Company accounts for shipping and handling activities related to contracts with customers as costs to fulfill the promise to transfer the associated products. These costs are included in selling, general, and administrative expenses.

Note 5. Cash Equivalents, Marketable Securities and Fair Value Measurements

The Company classifies any marketable security with a maturity date of 90 days or less at the time of purchase as a cash equivalent. Cash equivalents are carried on the balance sheet at fair market value. The Company's marketable securities, consisting of U.S. Treasuries, U.S. Government Agency, corporate debt securities, and commercial paper, are classified as available-for-sale securities and, accordingly, are recorded at fair value. The difference between amortized cost and fair value is included in stockholders' equity. At December 31, 2018 and March 31, 2018, the Company's financial instruments consisted primarily of cash and cash equivalents, marketable securities, accounts receivable, accounts payable and contingent consideration. The carrying amounts of accounts receivable and accounts payable are considered reasonable estimates of their fair value, due to the short maturity of these investments.

The Company's cash equivalents and marketable securities at December 31, 2018 and March 31, 2018 are classified on the balance sheet as follows:

	December 31, 2018	March 31, 2018
	(in $000's)	
Cash equivalents	$42,146	$22,595
Short-term marketable securities	373,975	319,274
Long-term marketable securities	—	37,502
	$416,121	$379,371

The Company's cash equivalents and marketable securities at December 31, 2018 and March 31, 2018 are invested in the following:

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Market Value
	(in $000's)			
December 31, 2018:				
Money market funds	$36,146	$ —	$ —	$36,146
Repurchase agreements	6,000	—	—	6,000
Short-term U.S. Treasury mutual fund securities	43,710	1	(37)	43,674
Short-term government-backed securities	183,531	13	(152)	183,392
Short-term corporate debt securities	114,193	46	(70)	114,169
Short-term commercial paper	32,792	—	(52)	32,740
	$416,372	$ 60	$ (311)	$416,121

	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Market Value
	(in $000's)			
March 31, 2018:				

Money market funds	$5,845	$ —	$ —	$5,845
Repurchase agreements	16,750	—	—	16,750
Short-term U.S. Treasury mutual fund securities	18,132	—	(29)	18,103
Short-term government-backed securities	212,255	3	(538)	211,720
Short-term corporate debt securities	52,737	—	(161)	52,576
Short-term commercial paper	36,936	2	(63)	36,875
Long-term U.S. Treasury mutual fund securities	10,953	—	(16)	10,937
Long-term government-backed securities	24,798	1	(12)	24,787
Long-term corporate debt securities	1,777	1	—	1,778
	$380,183	$ 7	$ (819)	$379,371

Fair Value Hierarchy

Fair value is defined as the price that would be received upon the sale of an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three categories:

Level 1: Quoted market prices in active markets for identical assets or liabilities.

Level 2: Observable market-based inputs or unobservable inputs that are corroborated by market data.

Level 3: Unobservable inputs that are not corroborated by market data.

Level 1 primarily consists of financial instruments whose values are based on quoted market prices such as exchange-traded instruments and listed equities.

Level 2 includes financial instruments that are valued using models or other valuation methodologies. These models are primarily industry-standard models that consider various assumptions, including time value, yield curve, volatility factors, prepayment speeds, default rates, loss severity, current market and contractual prices for the underlying financial instruments, as well as other relevant economic measures. Substantially all of these assumptions are observable in the marketplace, can be derived from observable data or are supported by observable levels at which transactions are executed in the marketplace.

Level 3 is comprised of unobservable inputs that are supported by little or no market activity. Financial assets are considered Level 3 when their fair values are determined using pricing models, discounted cash flows, or similar techniques, and at least one significant model assumption or input is unobservable.

The following table presents the Company’s financial instruments recorded at fair value in the consolidated balance sheets, classified according to the three categories described above:

December 31, 2018:	Level 1 (in $000's)	Level 2	Level 3	Total
Assets				
Money market funds	$36,146	$—	$—	$36,146
Repurchase agreements	—	6,000	—	6,000
Short-term U.S. Treasury mutual fund securities	—	43,674	—	43,674
Short-term government-backed securities	—	183,392	—	183,392
Short-term corporate debt securities	—	114,169	—	114,169
Short-term commercial paper	—	32,740	—	32,740
Liabilities				
Contingent consideration	—	—	10,583	10,583

March 31, 2018:	Level 1 (in $000's)	Level 2	Level 3	Total
Assets				
Money market funds	$5,845	$—	$—	$5,845

Repurchase agreements	—	16,750	—	16,750
Short-term U.S. Treasury mutual fund securities	—	18,103	—	18,103
Short-term government-backed securities	—	211,720	—	211,720
Short-term corporate debt securities	—	52,576	—	52,576
Short-term commercial paper	—	36,875	—	36,875
Long-term U.S. Treasury mutual fund securities	—	10,937	—	10,937
Long-term government-backed securities	—	24,787	—	24,787
Long-term corporate debt securities	—	1,778	—	1,778
Liabilities				
Contingent consideration	—	—	10,490	10,490

The Company has determined that the estimated fair value of its money market funds are reported as Level 1 financial assets as they are valued at quoted market prices in active markets.

The Company has determined that the estimated fair value of its investments in U.S. Treasury mutual fund securities, government-backed securities, corporate debt securities, repurchase agreements and commercial paper are reported as Level 2 financial assets as they are not exchange-traded instruments.

The Company’s financial liabilities consisted of contingent consideration potentially payable related to the acquisition of ECP Entwicklungsgesellschaft mbH, (“ECP”) and AIS GmbH Aachen Innovative Solutions, (“AIS’), in July 2014. The Company acquired ECP and AIS for $13.0 million in cash, with additional potential payouts totaling $15.0 million based on the achievement of CE Mark approval in the European Union and a revenue-based milestone related to the development of the future Impella ECP™ expandable catheter pump technology. These potential milestone payments may be made, at the Company’s option, by a combination of cash or ABIOMED common stock. The calculation of contingent consideration payable was determined using a combination of an income approach, based on various revenue and cost assumptions and applying a probability to each outcome and a Monte-Carlo valuation model. For the clinical and regulatory milestone, probabilities were applied to each potential scenario and the resulting values were discounted using a rate that considers weighted average cost of capital as well as a specific risk premium associated with the riskiness of the earn out itself, the related projections, and the overall business. The revenue-based milestone was valued using a Monte-Carlo valuation model, which simulates estimated future revenues during the earn out-period using management's best estimates. Projected revenues are based on the Company’s best estimates of revenues expected to be earned from future Impella ECP technology.

This liability is reported as Level 3 as the estimated fair value of the contingent consideration related to the acquisition of ECP requires significant management judgment or estimation and is calculated using the following valuation methods:

	Potential Milestone Payment (in $000's)	Fair Value at December 31, 2018	Valuation Methodology	Significant Unobservable Input	Weighted Average (range, if applicable)
Clinical and regulatory milestone	$7,000	$ 5,797	Probability weighted income approach	Projected fiscal year of milestone payments	2019 to 2022
				Discount rate	4.4% to 4.5%
				Probability of occurrence	Probability adjusted level of 40% for the base case scenario and 10% to 40% for various upside and downside scenarios
Revenue-based milestone	8,000	4,786	Monte Carlo simulation model	Projected fiscal year of milestone payments	2024 to 2035
				Discount rate	15%
				Expected volatility for forecasted revenues	50%

		Probability of payment	80%
$15,000	$ 10,583		

The following table summarizes the change in fair value, as determined by Level 3 inputs, of the contingent consideration for the three and nine months ended December 31, 2018 and 2017:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
Level 3 liabilities, beginning balance	$10,331	$9,835	$10,490	$9,153
Additions	—	—	—	—
Payments	—	—	—	—
Change in fair value	252	588	93	1,270
Level 3 liabilities, ending balance	$10,583	$10,423	$10,583	$10,423

The change in fair value of the contingent consideration was primarily due to the impact of changes in interest rates, passage of time on the fair value measurement and the status of development of the underlying technology related to the ECP acquisition. Adjustments associated with the change in fair value of contingent consideration are included in research and development expenses in the Company's consolidated statements of operations. Significant increases or decreases in any of the probabilities of success or changes in expected timelines for achievement of any of these milestones could result in a significantly higher or lower fair value of the liability. The fair value of the contingent consideration at each reporting date is updated by reflecting the changes in fair value in the Company's consolidated statement of operations. There is no assurance that any of the conditions for the milestone payments will be met.

Note 6. Property and Equipment

The components of property and equipment are as follows:

	December 31, 2018 (in $000's)	March 31, 2018
Land	$7,348	$7,680
Building and building improvements	85,875	63,700
Leasehold improvements	2,182	2,905
Machinery and equipment	51,980	42,787
Furniture and fixtures	10,153	8,104
Construction in progress	17,092	19,850
Total cost	174,630	145,026
Less accumulated depreciation	(36,175)	(27,859)
	$138,455	$117,167

Note 7. Goodwill, In-Process Research and Development, and Other Assets

Goodwill

The carrying amount of goodwill at December 31, 2018 and March 31, 2018 was $33.3 million and $35.8 million, respectively, and has been recorded in connection with the Company's acquisition of Impella Cardiosystems AG, in May 2005 and ECP and AIS in July 2014. The goodwill activity is as follows:

	(in $000's)
Balance at March 31, 2018	$35,808
Foreign currency translation impact	(2,548)
Balance at December 31, 2018	$33,260

In-Process Research & Development

The Company evaluates goodwill and in-process research and development ("IPR&D") assets at least annually at October 31, as well as whenever events or changes in circumstances suggest that the carrying amount may not be recoverable. The Company has no accumulated impairment losses on goodwill or IPR&D assets.

The carrying amount of IPR&D assets at December 31, 2018 and March 31, 2018 was $15.5 million and $16.7 million, respectively, and was recorded in conjunction with the Company's acquisition of ECP and AIS, in July 2014. The estimated fair value of IPR&D assets at the acquisition date was determined using a probability-weighted income approach, which discounts expected future cash flows to present value. The projected cash flow estimates for the future Impella ECP™ expandable catheter pump technology were based on certain key assumptions, including estimates of future revenue and expenses, taking into account the stage of development of the technology at the acquisition date and the time and resources needed to complete development. The Company used an original discount rate of 21% and cash flows that have been probability adjusted to reflect the risks of product commercialization, which the Company believes are appropriate and representative of market participant assumptions.

The carrying value of the Company's IPR&D assets and the change in the balance for the nine months ended December 31, 2018 are as follows:

	(in $000's)
Balance at March 31, 2018	$16,705
Foreign currency translation impact	(1,189)
Balance at December 31, 2018	$15,516

Other Assets

Other Investments

The Company periodically makes investments in private medical device companies that focus on heart failure, heart pump and other medical device technologies. The aggregate carrying amount of the Company's other investments was $40.8 million and $12.6 million at December 31, 2018 and March 31, 2018, respectively, and is classified within other assets on the consolidated balance sheets. During the nine months ended December 31, 2018, the Company made additional investments of $28.1 million in private medical device companies.

On April 1, 2018, the Company adopted ASU 2016-01. This guidance requires equity investments to be measured at fair value with changes in fair value recognized in net income. Since these investments do not have readily determinable market values, the Company has elected to measure these investments at cost minus impairment, if any, plus or minus changes resulting from observable price changes in orderly transactions for an identical or similar investment. No adjustments have been made to the value of the Company's investments in these private medical device companies for the three and nine months ended December 31, 2018 either due to impairment or based on observable price changes. The Company monitors any events or changes in circumstances that may have a significant adverse effect on the fair value of this investment and makes any necessary adjustments.

Other Intangible Assets

In September 2018, the Company made a milestone payment to a third party for approximately $1.8 million for the transfer to the Company of manufacturing rights and knowledge for optical sensor technology that is approved for use in the Impella CP products. In October 2018, the Company made a payment to a third party for approximately $0.6 million to license certain manufacturing technology related to introducer sheaths. These intangible assets are classified with other assets in the Company's consolidated balance sheet and are amortized over their useful life of 15 years.

Note 8. Accrued Expenses

Accrued expenses consist of the following:

	December 31,	March 31,

	2018	2018
	(in $000's)	
Employee compensation	$31,930	$30,330
Sales and income taxes	7,312	4,562
Research & development	3,371	3,162
Marketing	3,082	2,305
Professional, legal, and accounting fees	1,994	1,870
Warranty	1,300	1,081
Accrued capital expenditures	—	250
Other	2,732	2,587
	$51,721	$46,147

Employee compensation consists primarily of accrued bonuses, accrued commissions, accrued employee benefits, and accrued payroll taxes at December 31, 2018 and March 31, 2018.

Note 9. Stock-Based Compensation

The following table summarizes stock-based compensation expense by financial statement line item in the Company's consolidated statements of operations for the three and nine months ended December 31, 2018 and 2017:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
Cost of product revenue	$773	$489	$2,122	$1,221
Research and development	2,638	1,673	7,222	4,217
Selling, general and administrative	12,167	9,070	34,413	23,732
	$15,578	$11,232	$43,757	$29,170

Stock Options

The following table summarizes the stock option activity for the nine months ended December 31, 2018:

	Options (in thousands)	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (years)	Aggregate Intrinsic Value (in thousands)
Outstanding at beginning of period	1,282	$46.18	5.31	
Granted	78	381.62		
Exercised	(435)	25.36		
Cancelled and expired	(19)	145.89		
Outstanding at end of period	906	$83.90	5.74	$222,852
Exercisable at end of period	668	$39.86	4.78	$190,646
Options vested and expected to vest at end of period	896	$83.73	5.72	$220,460

Stock options generally vest and become exercisable annually over three years. The remaining unrecognized stock-based compensation expense for unvested stock option awards at December 31, 2018 was approximately $14.0 million and the estimated weighted-average period over which this cost will be recognized is 2.1 years.

The aggregate intrinsic value of options exercised was $158.6 million for the nine months ended December 31, 2018. The total cash received as a result of employee stock options exercised during the nine months ended December 31, 2018 was approximately $11.0 million.

The Company estimates the fair value of stock options granted at the grant date using the Black-Scholes option valuation model. The weighted average grant-date fair values and weighted average assumptions used in the calculation of fair value of stock options granted during the three and nine months ended December 31, 2018 and 2017 was as follows:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Weighted average grant-date fair value	$117.50	$70.14	$142.08	$51.20
Valuation assumptions:				
Risk-free interest rate	2.81 %	2.13 %	2.93 %	1.86 %
Expected option life (years)	4.04	4.08	4.04	4.07
Expected volatility	45.2 %	42.2 %	42.8 %	43.6 %

Restricted Stock Units

The following table summarizes activity of restricted stock units for the nine months ended December 31, 2018:

	Number of Shares (in thousands)	Weighted Average Grant Date Fair Value (per share)
Restricted stock units at beginning of period	880	$ 109.01
Granted	193	$ 379.30
Vested	(418)	$ 103.66
Forfeited	(25)	$ 187.05
Restricted stock units at end of period	630	$ 192.16

Restricted stock units generally vest annually over three years. The remaining unrecognized compensation expense for outstanding restricted stock units, including performance and market-based awards, as of December 31, 2018 was $60.9 million and the estimated weighted-average period over which this cost will be recognized is 2.1 years.

The weighted average grant-date fair value for restricted stock units granted during the nine months ended December 31, 2018 was $379.30. The total fair value of restricted stock units vested during the nine months ended December 31, 2018 was $168.1 million.

Performance-Based Awards

In May 2018, performance-based awards of restricted stock units for the potential issuance of approximately 114,000 shares of common stock were issued to certain executive officers and employees, which vest upon achievement of prescribed service milestones by the award recipients and performance milestones by the Company. As of December 31, 2018, the Company is recognizing compensation expense based on the probable outcome related to the prescribed performance targets on the outstanding awards.

Note 10. Income Taxes

In December 2017, the Tax Cuts and Jobs Act, ("Tax Reform Act") was signed into law. The Tax Reform Act included significant changes to existing law, including among other items, a reduction to the U.S. federal statutory corporate tax rate from 35% to 21% effective January 1, 2018. ASC 740, Income Taxes (Topic 740) requires that the effects of changes in tax laws or rates be recognized in the period in which the law is enacted. Those effects, both current and deferred, are reported as part of the tax provision, regardless of income in which the underlying pretax income (expense) or asset (liability) was or will be reported.

As a result of the Tax Reform Act, the Company's U.S. federal statutory corporate income tax rate of 21% was applied in the computation of the income tax provision for the three and nine months ended December 31, 2018.

The Company's income tax provision was $19.6 million for the three months ended December 31, 2018. The Company's income tax benefit was $20.2 million for the nine months ended December 31, 2018. The Company's income tax provision was $32.2 million and $36.6 million for the three and nine months ended December 31, 2017, respectively. The Company's effective tax rate was 30.5% and (12.3)% for the three and nine months ended December 31, 2018, respectively, and 70.6% and 32.7% for the three and nine months ended December 31, 2017, respectively.

Consistent with guidance issued by the SEC, which provides for a measurement period of one year from the enactment date to finalize the accounting for effects of the Tax Reform Act, the Company provisionally remeasured its net deferred tax assets due to the lower U.S. federal statutory corporate tax rate during the year ended March 31, 2018. The Company's provisional estimate reflected estimable impacts of the Tax Reform Act on the Company's estimated annual effective tax rate and discrete items resulting directly from the enactment of the Tax Reform Act based on the information available, prepared, or analyzed (including computations) in reasonable detail. Any adjustments to this provisional estimate would be recorded as adjustments to income tax expense in the period in which those adjustments become estimable and/or are finalized, if necessary. No adjustments were made to the Company's provisional estimate of the impacts of the Tax Reform Act during the three and nine months ended December 31, 2018. This measurement period ended the quarter ended December 31, 2018.

The Company recognizes excess tax benefits and shortfalls in the income tax provision as discrete items in the period in which restricted stock units vest or stock option exercises occur. The Company recognized excess tax benefits associated with stock-based awards of $1.7 million and $68.5 million as an income tax benefit for the three and nine months ended December 31, 2018, respectively, and $3.2 million and $24.5 million as an income tax benefit for the three and nine months ended December 31, 2017, respectively. The amount of future excess tax benefits or shortfalls will likely fluctuate from period to period based on the price of the Company's stock, the number of restricted stock units that vest or stock options that are exercised, and the fair value assigned to such stock-based awards under U.S. GAAP.

The significant differences between the statutory and effective income tax rate for the three and nine months ended December 31, 2018 and 2017 consist of the following items:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Statutory income tax rate	21.0 %	31.5 %	21.0 %	31.5 %
Increase resulting from:				
Excess tax benefits from stock-based awards	(2.6)	(7.0)	(41.5)	(21.9)
Credits	(1.7)	(2.1)	(1.7)	(2.1)
State taxes, net	4.3	3.7	4.3	3.7
Permanent differences	1.8	1.7	1.8	1.7
Effect of the Tax Reform Act on net deferred tax assets	—	42.1	—	19.6
Excess foreign tax credits	7.9	—	3.7	—
Other	(0.2)	0.7	0.1	0.2
Effective tax rate	30.5 %	70.6 %	(12.3)%	32.7 %

The recently enacted Tax Reform Act allows for a 100% deduction for the potential repatriation of foreign subsidiary earnings with minimal U.S. income tax consequences other than the one-time deemed repatriation toll charge. Since most of the Company's cash and cash equivalents held by foreign subsidiaries which are disregarded entities for domestic tax purposes, any repatriation of such funds to the U.S. would likely have a nominal tax impact.

The Company and its subsidiaries are subject to U.S. federal income tax, as well as income tax of multiple state and foreign jurisdictions. During the nine months ended December 31, 2018, the Company closed an income tax audit in Germany which covered fiscal years 2012 through 2015. The audit resulted in an immaterial adjustment to our financial statements. Fiscal years 2016 through 2018 remain open to examination in Germany. The Company also closed an Internal Revenue Service ("IRS") audit relating to its fiscal year 2016 tax return. The audit resulted in an immaterial adjustment to our financial statements. All other tax years remain subject to examination by the IRS, state and foreign tax authorities.

Note 11. Commitments and Contingencies

Commitments

Leases

In February 2017, the Company entered into a lease agreement for 21,603 square feet of office space in Danvers, Massachusetts expiring on July 31, 2022. In December 2017, the Company entered into an amendment to this lease to extend the term through August 31, 2025 and to add an additional 6,607 square feet of space for which rent began on June 1, 2018. In March 2018, the Company entered into a second amendment to the lease to add an additional 11,269 square feet of space. In July 2018, the Company entered into an amendment to lease an additional 23,864 square feet of space from October 1, 2018 through September 30, 2027. With this most recent amendment, the Company has leased 63,343 square feet in total at this location as of October 1, 2018. The Company also has a right of first offer to purchase the property from January 1, 2018 through August 31, 2035, if the lessor decides to sell the building. The annual rent expense for this lease is estimated to be $0.9 million.

In September 2016, the Company entered into a lease agreement for an office in Berlin, Germany which commenced in May 2017 and expires in May 2024. The annual rent expense for this lease is estimated to be $0.3 million.

In October 2016, the Company entered into a lease agreement for an office in Tokyo, Japan which expires in September 2021. The office houses administrative, regulatory, and training personnel in connection with the Company’s commercial launch in Japan. The annual rent expense for this lease is estimated to be $0.9 million.

Contingencies

From time to time, the Company is involved in legal and administrative proceedings and claims of various types. In some actions, the claimants seek damages, as well as other relief, which, if granted, would require significant expenditures. The Company records a liability in its consolidated financial statements for these matters when a loss is known or considered probable and the amount can be reasonably estimated. The Company reviews these estimates each accounting period as additional information is known and adjusts the loss provision when appropriate. If a matter is both probable to result in liability and the amount of loss can be reasonably estimated, the Company estimates and discloses the possible loss or range of loss. If the loss is not probable or cannot be reasonably estimated, a liability is not recorded in its consolidated financial statements.

Thoratec Matters

Thoratec Corporation, or Thoratec, a subsidiary of Abbott Laboratories, has challenged a number of Company-owned patents in Europe in connection with the launch of its HeartMate PHP medical device, or PHP, in Europe. These actions relate to Thoratec's ability to manufacture and sell its PHP product in Europe. These actions do not relate to the Company's ability to manufacture or sell its Impella line of devices.

In December 2014, Thoratec filed a nullity suit in the German Federal Patent Court against a German "pigtail" patent owned by the Company with a flexible extension feature, and auxiliary pigtail, basket and funnel features. The validity hearing was held in November 2016 and the Federal Patent Court found the patent invalid. The Company appealed the decision to the German Supreme Court and, in November 2018, successfully obtained a patent with amended claims covering a pump with the flexible extension and the basket with a funnel.

In August 2015, Thoratec filed a nullity action in the German Federal Patent Court against two Company-owned patents covering a "magnetic clutch" feature. These magnetic clutch patents were acquired by the Company in July 2014, in connection with its acquisition of ECP and AIS. The validity hearing for the magnetic clutch patents was held in June 2017. The Company's patents were upheld in an amended form to focus on the structure and interaction of the magnets in the clutch. The Federal Patent Court found certain unamended claims to be invalid. The Company is appealing the decision with respect to the unamended claims.

In September 2015, the Company filed counterclaims in the magnetic clutch action in Germany asserting that the PHP product infringes the two magnetic clutch patents, a European pigtail patent and the German pigtail patent. The infringement trial has been stayed, pending resolution of the German nullity actions.

In February 2017, Thoratec filed an opposition in the European Patent Office ("EPO"), against a Company-owned patent acquired in connection with the acquisition of ECP and AIS relating to a housing structure for an expandable pump. The Company filed an initial response to the opposition in July 2017. Oral proceedings were held on October 26, 2018, at which time the EPO revoked the patent. A written decision documenting the reasons for the revocation is expected to issue within a few months, after which the Company may file an appeal. In December 2017, Thoratec filed an opposition in the EPO against a Company-owned patent acquired in connection with the acquisition of ECP and AIS relating to a pump having a shaft cap with an atraumatic ball. The Company responded to the opposition on May 27, 2018. On January 24, 2019 the EPO Opposition Division upheld patent claims related to a pump design with an atraumatic ball. A written decision summarizing that finding is expected later this calendar year.

Maquet Matters

In December 2015, the Company received a letter from Maquet Cardiovascular LLC, or Maquet, a subsidiary of the Getinge Group, asserting that the Company's Impella devices infringe certain claims having guidewire, lumen and sensor features, which were in two Maquet patents and one pending patent application in the U.S. and elsewhere, and attached a draft litigation complaint and encouraged the Company to take a license from Maquet. In January 2016, the Company responded to Maquet stating that it believed that the cited claims were invalid and that its Impella devices did not infringe the cited patents. In May 2016, Maquet notified the Company that its pending U.S. patent application had been issued as a U.S. patent, repeated their earlier assertion and encouraged the Company to discuss taking a license from Maquet. The three patents expire September 2020, December 2020 and October 2021. In May 2016, the Company filed suit in U.S. District Court for the District of Massachusetts ("D. Mass.") against Maquet seeking a declaratory judgment that the Company's Impella devices do not infringe Maquet's cited patent rights.

In August 2016, Maquet sent a letter to the Company identifying four new U.S. continuation patent filings with claims that Maquet alleges are infringed by the Company's Impella devices. Of the four U.S. continuation applications, one issued as a patent on January 17, 2017, one issued as a patent on February 7, 2017, one issued as a patent on March 21, 2017, and one issued as a patent on October 17, 2017. These four issued patents will expire in September 2020.

In September 2016, Maquet filed a response to the Company's suit in D. Mass., including various counterclaims alleging that the Company's Impella 2.5, Impella CP, Impella 5.0, and Impella RP heart pumps infringe certain claims of the three original issued U.S. patents ("2016 action"). On June 15, 2017, Maquet filed a motion for leave to amend its infringement counterclaims to add the first three additional U.S. continuation patents mentioned above and to file various false advertising, unfair competition claims under state law and under the Lanham Act, and a trademark cancellation in the pending case. Maquet's amended complaint and counterclaim, like those it originally filed, seek injunctive relief and monetary damages in the form of a reasonable royalty, with three times the amount for alleged willful infringement. The amended complaint admits that Maquet's current commercially available products do not embody the claims of the asserted patents. On July 21, 2017, the Court granted the motion in part, allowing the three additional continuation patents to be added to the case, but denying addition of the false advertising claims, Lanham Act claims, and the trademark cancellation claims. On April 24 and 25, 2018, the Court conducted a Markman hearing on claim interpretation. On September 7, 2018, the judge issued a Memorandum and Order on Claim Construction, where he interpreted the disputed claim terms in the case. A hearing was held on November 2, 2018 to re-hear arguments on one of the terms. Discovery remains ongoing. No schedule has yet been set for the remainder of the case. With regard to the first six Maquet patents mentioned above, in March and April 2017, the Company filed requests for inter partes review, ("IPR"), at the U.S. Patent & Trademark Office's Patent Trial and Appeals Board ("PTAB") asserting that the claims are invalid in view of prior art blood pump technology. In September and October 2017, the PTAB denied institution on these IPR requests filed by the Company. In September 2017, the Company filed additional IPRs and in March and April 2018, the PTAB denied institution of these IPR petitions.

On November 22, 2017, Maquet filed a second lawsuit in D. Mass alleging that the Company's Impella 2.5, Impella CP, and Impella 5.0 heart pumps infringe certain claims of the fourth additional U.S. continuation patent mentioned above (the seventh patent overall). In the complaint, Maquet seeks injunctive relief and monetary damages in the form of a reasonable royalty, with three times the amount for alleged willful infringement. In its answer to ABIOMED's counterclaim, Maquet admits that its current commercially available products do not embody the claims of the asserted patents. This second action is in its early stages.

The Company is unable to estimate the potential liability with respect to the legal matters noted above. There are numerous factors that make it difficult to meaningfully estimate possible loss or range of loss at this stage of the legal proceedings, including the significant number of legal and factual issues still to be resolved in the Marquet and Thoratec patent disputes.

Note 12. Segment and Enterprise Wide Disclosures

The Company operates in one business segment—the research, development and sale of medical devices to assist or replace the pumping function of the failing heart. The Company's chief operating decision maker (determined to be the Chief Executive Officer) does not manage any part of the Company separately, and the allocation of resources and assessment of performance are based on the Company's consolidated operating results. International sales (sales outside the U.S., primarily in Germany and Japan) accounted for 14% and 13% of total revenue for the three and nine

months ended December 31, 2018, respectively, and 11% of total revenue in each of the three and nine months ended December 31, 2017, respectively. The Company's long-lived assets are located in the U.S. except for $41.7 million and $35.5 million at December 31, 2018 and March 31, 2018, respectively, which are located primarily in Germany.

ITEM 2: MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Forward Looking Statements

This Report contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended and Section 21E of the Securities Exchange Act of 1934, as amended. Any statements other than one conveying solely historical facts is a forward-looking statement. These forward-looking statements may be accompanied by words such as "anticipate," "believe," "estimate," "expect," "forecast," "intend," "may," "plan," "potential," "target," "will" and other words and terms of similar meaning. These forward-looking statements address various matters including, among others, future actions related to ongoing investigations and litigation and expenditures related thereto; the development and commercialization of new and existing products and anticipated costs, including research and development, sales and marketing and training costs associated with product development and commercialization; the anticipated launch dates of technological improvements in existing products and studies in pipeline products; expected capital expenditures for the fiscal year ending March 31, 2019; commercial plans for our products into new markets such as Japan; expected enrollment in our prospective feasibility study; demand and expected shipments of our products; anticipated shifts in the revenue mix associated with our products; our ability to increase revenue from our Impella® line of products and the sufficiency of revenue to fund future operations; the impact of market factors such as changes in interest rates, currency exchange rates on our securities and the fair value of our financial instruments; awards of performance and market-based restricted stock units; and the impact of ASU 2016-02 on our consolidated financial statements and disclosures. Each forward-looking statement in this Report is subject to risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statement, including, among others: our inability to predict the outcome of investigations and litigation and associated expenses; possible delays in our research and development programs; our ability to obtain regulatory approvals and market our products, and uncertainties related to regulatory processes; greater government scrutiny and regulation of the medical device industry and our ability to respond to changing laws and regulations affecting our industry, including any reforms to the regulatory approval process administered by the U.S Food and Drug Administration, or FDA, and changing enforcement practices related thereto; the inability to manufacture products in commercial quantities at an acceptable cost; the acceptance by physicians and hospitals of our products; the impact of competitive products and pricing; uncertainties associated with future capital needs and the risks identified under Item 1A of Part I of our Annual Report on Form 10-K, for the year ended March 31, 2018, as well as the other information we file with the Securities and Exchange Commission. Readers are cautioned not to place considerable reliance on any forward-looking statements contained in this Report, which speak only as of the date of this Report. We undertake no obligation to update or revise these forward-looking statements whether as a result of new information, future events or otherwise, unless required by law. Our business is subject to substantial risks and uncertainties, including those referenced above. Investors, potential investors, and others should give careful consideration to these risks and uncertainties.

Overview

We are a leading provider of temporary mechanical circulatory support devices, and we offer a continuum of care to heart failure patients. We develop, manufacture and market proprietary products that are designed to enable the heart to rest, heal and recover by improving blood flow to the coronary arteries and end-organs and/or temporarily assisting the pumping function of the heart. Our products are used in the cardiac catheterization lab, or cath lab, by interventional cardiologists, the electrophysiology lab, the hybrid lab and in the heart surgery suite by cardiac surgeons. A physician may use our devices for patients who are in need of hemodynamic support prophylactically, urgently or emergently before, during or after angioplasty or heart surgery procedures. We believe that heart recovery is the optimal clinical outcome for a patient experiencing heart failure because it enhances the potential for the patient to go home with their own heart, facilitating the restoration of quality of life. In addition, we believe that, for the care of such patients, heart recovery is often the most cost-effective solution for the healthcare system.

Our strategic focus and the driver of our revenue growth is the market penetration of our family of Impella® heart pumps. The Impella device portfolio, which includes the Impella 2.5®, Impella CP®, Impella RP®, Impella LD® and Impella 5.0® devices, has supported numerous patients worldwide. All of our product and service revenue in the near future will be from our Impella devices.

In March 2015, we received a PMA from the FDA for use of the Impella 2.5 device during elective and urgent high-risk percutaneous coronary intervention, or PCI, procedures. In December 2016, the FDA expanded this PMA in the U.S. to include the Impella CP device. With these approved indications, the Impella 2.5 and Impella CP devices provide the only minimally invasive treatment options indicated for use during high-risk PCI procedures in the U.S. In April 2016, the FDA approved a PMA supplement for our Impella 2.5, Impella CP, Impella 5.0 and Impella LD devices to provide treatment for ongoing cardiogenic shock that occurs following a heart attack or open heart surgery. The intent of our Impella system therapy is to reduce ventricular work and to provide the circulatory support necessary to allow heart recovery and early assessment of residual myocardial function.

In September 2017, we received a PMA from the FDA for the Impella RP heart pump. The Impella RP heart pump is indicated for providing temporary right ventricular support for up to 14 days in patients with a body surface area ≥1.5 m², who develop acute right heart failure or decompensation following left ventricular assist device implantation, myocardial infarction, heart transplant, or open-heart surgery. With this approval, the Impella RP heart pump is the only percutaneous temporary ventricular support device that is FDA-approved as safe and effective for right heart failure as stated in the indication.

In February 2018, we received two expanded PMAs from the FDA for our Impella heart pumps. The first expanded approval is for use of Impella 2.5, Impella CP, Impella 5.0 and Impella LD heart pumps on patients with cardiogenic shock associated with cardiomyopathy, including peripartum and postpartum cardiomyopathy. The second expanded PMA is for use of the Impella 2.5 and Impella CP heart pumps during elective and high-risk PCI procedures. This expanded PMA confirms Impella support as appropriate in patients with severe coronary artery disease, complex anatomy and extensive comorbidities, with or without depressed ejection fraction.

In April 2018, we received FDA approval for Impella CP SMARTASSIST™ and Optical Sensor technology which is intended to provide enhanced monitoring capability, reduce setup time and improve ease of use for physicians. The optical sensor technology is also approved under CE Mark in the European Union and other countries that require a CE Mark approval. We have begun selling Impella CP pumps with this optical sensor technology at certain sites.

In September 2016, we received Pharmaceuticals and Medical Devices Agency, or PMDA, approval from the Japanese Ministry of Health, Labour & Welfare, or MHLW, for our Impella 2.5 and Impella 5.0 heart pumps to provide treatment of drug-resistant acute heart failure in Japan. In July 2017, we received approval from the MHLW for reimbursement for the Impella 2.5 and 5.0 heart pumps. We continue to focus on our controlled commercial launch of Impella devices in Japan.

Our Impella 2.5, Impella 5.0, Impella LD, Impella CP and Impella RP devices also have CE Mark approval and Health Canada approval, which allows us to market these devices in the European Union and Canada.

In May 2017, we began enrollment in an FDA approved prospective multi-center feasibility study, STEMI Door to Unloading with Impella CP system in acute myocardial infarction. This study focuses on the feasibility and safety of unloading the left ventricle using the Impella CP heart pump prior to primary PCI in patients presenting with ST segment elevation myocardial infarction, or STEMI, without cardiogenic shock with the hypothesis that this will potentially reduce infarct size. The study, which received FDA approval in October 2016, enrolled up to 50 patients at 10 sites. We completed enrollment in the study during the quarter ended June 30, 2018. In November 2018, we announced the results presented data on this feasibility study. We are working with the FDA to move forward with a pivotal, multi-center, prospective randomized controlled clinical trial comparing unloading with Impella with delayed reperfusion compared to the current standard of care of immediate reperfusion without Impella. We expect to begin this trial in calendar year 2019.

We expect to continue to make additional PMA supplement submissions for our Impella portfolio of devices for additional indications.

Our Existing Products

Impella 2.5®

The Impella 2.5 device is a percutaneous micro heart pump with an integrated motor and sensors. The device is designed primarily for use by interventional cardiologists to support patients in the cath lab who may require assistance to maintain circulation. The Impella 2.5 heart pump can be quickly inserted via the femoral artery to reach

the left ventricle of the heart, where it is directly deployed to draw blood out of the ventricle and deliver it to the circulatory system. This function is intended to reduce ventricular work and provide blood flow to vital organs. The Impella 2.5 heart pump is introduced with normal interventional cardiology procedures and can pump up to 2.5 liters of blood per minute.

In March 2015, we received a PMA from the FDA for the use of the Impella 2.5 device during elective and urgent high-risk PCI procedures. With this PMA, the Impella 2.5 device became the first FDA approved hemodynamic support device for use during high-risk PCI procedures. Under this first PMA, the Impella 2.5 is a temporary (up to six hours) ventricular support device indicated for use during high-risk PCI performed in elective or urgent hemodynamically stable patients with severe coronary artery disease and depressed left ventricular ejection fraction, when a heart team, including a cardiac surgeon, has determined high-risk PCI is the appropriate therapeutic option. Use of the Impella 2.5 device in these patients may prevent hemodynamic instability that may occur during planned temporary coronary occlusions and may reduce periprocedural and post-procedural adverse events. The product labeling allows for the clinical decision by physicians to leave the Impella 2.5 device in place beyond the intended duration of up to six hours should unforeseen circumstances arise.

In April 2016, the FDA approved a supplement to our March 2015 PMA for the use of our Impella 2.5, Impella CP, Impella 5.0 and Impella LD devices to provide treatment for ongoing cardiogenic shock. This PMA supplement covers a set of indications related

to the use of the Impella devices in patients suffering cardiogenic shock following acute myocardial infarction or cardiac surgery and allows for a longer duration of support.

Pursuant to the April 2016 PMA, the Impella 2.5, Impella CP, Impella 5.0 and Impella LD catheters, in conjunction with the Automated Impella Controller, or AIC, were approved as temporary ventricular support devices intended for short term use (≤ 4 days for the Impella 2.5 and Impella CP, and ≤ 6 days for the Impella 5.0 and LD) and indicated for the treatment of ongoing cardiogenic shock that occurs immediately (< 48 hours) following acute myocardial infarction or open heart surgery as a result of isolated left ventricular failure that is not responsive to optimal medical management and conventional treatment measures. The intent of the Impella system therapy is to reduce ventricular work and to provide the circulatory support necessary to allow heart recovery and early assessment of residual myocardial function. Optimal medical management and convention treatment measures include volume loading and use of pressors and inotropes, with or without an intraortic balloon pump, or IABP.

The Impella 2.5 device has CE Mark approval in the European Union for up to five days of use and is approved for use in up to 40 countries. The Impella 2.5 device also has Health Canada approval which allows us to market the device in Canada.

In September 2016, we received PMDA approval from the Japanese MHLW for our Impella 2.5 and Impella 5.0 heart pumps to provide treatment of drug-resistant acute heart failure in Japan. In July 2017, we received approval from the MHLW for reimbursement of the Impella 2.5 and 5.0 heart pumps. Reimbursement in Japan for the Impella 2.5 and 5.0 is equivalent to our average Impella sales price in the U.S. We continue to focus on our controlled commercial launch of Impella devices in Japan.

In February 2018, we received two expanded PMAs from the FDA for our Impella heart pumps. The first expanded PMA is for use of Impella 2.5, Impella CP, Impella 5.0 and Impella LD heart pumps on patients with cardiogenic shock associated with cardiomyopathy, including peripartum and postpartum cardiomyopathy. The second expanded PMA was for use of the Impella 2.5 and Impella CP heart pumps during elective and high-risk PCI procedures. This expanded PMA confirms Impella support as appropriate in patients with severe coronary artery disease, complex anatomy and extensive comorbidities, with or without depressed ejection fraction.

Impella CP®

The Impella CP device provides blood flow of approximately one liter more per minute than the Impella 2.5 device and is primarily used by either interventional cardiologists to support patients in the cath lab or by cardiac surgeons in the heart surgery suite.

In April 2016, the FDA approved the PMA supplement for certain of our devices, including our Impella CP device to provide treatment for ongoing cardiogenic shock.

In February 2018, we received two expanded PMAs from the FDA for our Impella heart pumps. The first expanded PMA is for use of Impella 2.5, CP, 5.0 and LD heart pumps on patients with cardiogenic shock associated with cardiomyopathy, including peripartum and postpartum cardiomyopathy. The second expanded PMA is for use of the Impella 2.5 and Impella CP heart pumps during elective and high-risk PCI procedures. This expanded PMA confirms Impella support as appropriate in patients with severe coronary artery disease, complex anatomy and extensive comorbidities, with or without depressed ejection fraction.

These PMAs allow the Impella CP to be used as a temporary (≤ 6 hours) ventricular support system indicated for use during high risk PCI procedures performed in elective or urgent hemodynamically stable patients with severe coronary artery disease and depressed left ventricular ejection fraction, when a heart team, including a cardiac surgeon, has

determined that high-risk PCI is the appropriate therapeutic option. The product labeling allows for the clinical decision by physicians to leave the Impella CP device in place beyond the intended duration of up to six hours should unforeseen circumstances arise.

The Impella CP device has CE Mark approval in the European Union and other countries that require a CE Mark approval for up to five days of use.

In April 2018, we received FDA approval for Impella CP SMARTASSIST™ and Optical Sensor technology which is intended to provide enhanced monitoring capability, reduce setup time and improve ease of use for physicians. We have begun selling Impella CP pumps with this optical sensor technology at certain sites. The optical sensor technology is also approved under CE Mark in the European Union and other countries that require a CE Mark approval.

In May 2017, we began enrollment in an FDA approved prospective multi-center feasibility study, STEMI Door to Unloading with Impella CP system in acute myocardial infarction. The trial focuses on the feasibility and safety of unloading the left ventricle using the Impella CP heart pump prior to primary PCI in patients presenting with ST segment elevation myocardial infarction, or STEMI, without cardiogenic shock with the hypothesis that this will potentially reduce infarct size. The study, which received FDA investigational device approval to proceed in October 2016, enrolled up to 50 patients at 10 sites. We completed enrollment in the study during the quarter ended June 30, 2018.

The primary endpoints of the feasibility study will focuses on safety, including major adverse cardiovascular and cerebrovascular events, or MACCE, at 30 days. All patients will undergo cardiac magnetic resonance imaging to assess infarct size as a percent of left ventricular mass at 30 days post-PCI. Patients are randomized to Impella CP placement with immediate primary PCI, or to Impella CP placement with 30 minutes of unloading prior to primary PCI. The hypothesis of this novel approach to treating STEMI patients, based on extensive mechanistic research, is that unloading the left ventricle prior to PCI reduces myocardial work load, oxygen demand and also initiates a cardio-protective effect at the myocardial cell level, which may alleviate myocardial damage caused by reperfusion injury at the time of revascularization. The intent of this study is to help refine the protocol and lay the groundwork for a future pivotal study with more sites and patients and will be designed for statistical significance.

In November 2018, we announced the results presented data on this feasibility study. We are working with the FDA to move forward with a pivotal, multi-center, prospective randomized controlled clinical trial comparing unloading with Impella with delayed reperfusion compared to the current standard of care of immediate reperfusion without Impella. We expect to begin this trial in calendar year 2019.

Impella 5.0® and Impella LD®

The Impella 5.0 and Impella LD devices are percutaneous micro heart pumps with integrated motors and sensors for use primarily in the heart surgery suite. These devices are designed to support patients who require higher levels of circulatory support as compared to the Impella 2.5.

The Impella 5.0 device can be inserted into the left ventricle via femoral cut down or through the axillary artery. The Impella 5.0 device is passed into the ascending aorta, across the valve and into the left ventricle. The Impella LD device is similar to the Impella 5.0 device, but it is implanted directly into the ascending aorta through an aortic graft. Both of these procedures are normally performed by cardiac surgeons in the surgery suite. The Impella 5.0 and Impella LD devices can pump up to five liters of blood per minute, potentially providing full circulatory support.

In April 2016, the FDA approved the PMA supplement for certain of our devices, including the Impella 5.0 and Impella LD devices to provide treatment for ongoing cardiogenic shock following a heart attack or open heart surgery. In February 2018, we received an expanded PMA from the FDA for use of Impella 2.5, Impella CP, Impella 5.0, and Impella LD heart pumps to provide treatment for heart failure associated with cardiomyopathy leading to cardiogenic shock. This approval expands the previous indication for acute myocardial infarction, or AMI, cardiogenic shock and post-cardiotomy shock, or PCCS, received in April 2016.

The Impella 5.0 and Impella LD devices have CE Mark approval in the European Union for up to ten days' duration and are approved for use in over 40 countries.

In July 2017, we received approval from the Japanese MHLW for reimbursement for the Impella 2.5 and 5.0 heart pumps. We continue to focus on our controlled commercial launch of Impella devices in Japan.

Impella RP®

The Impella RP is a percutaneous catheter-based axial flow pump that is designed to allow greater than four liters of blood flow per minute and is intended to provide the flow and pressure needed to compensate for right side heart failure. The Impella RP is the first percutaneous single access heart pump designed for right heart support to receive FDA approval. The Impella RP device is approved to provide support of the right heart during times of acute failure for certain patients who have received a left ventricle assist device or have suffered heart failure due to AMI, a failed heart transplant, or following open heart surgery.

In September 2017, we received a PMA from the FDA for the Impella RP heart pump. This latest approval follows the prior FDA HDE received in January 2015 and adds the Impella RP heart pump to our platform of devices with PMAs. The Impella RP heart pump is indicated for providing temporary right ventricular support for up to 14 days in patients with a body surface area ≥1.5 m² who develop acute right heart failure or decompensation following left ventricular assist device implantation, myocardial infarction, heart transplant, or open-heart surgery. With this approval, the Impella RP heart pump is the only percutaneous temporary ventricular support device that is FDA-approved as safe and effective for right heart failure as stated in the indication.

The Impella RP device has CE Mark approval for commercial sale in the European Union and other countries that require a CE Mark approval from commercial sales.

Our Product Pipeline

Impella 5.5™

The Impella 5.5 device is designed to be a percutaneous micro heart pump with integrated motors and sensors. The Impella 5.5 device is designed to be smaller, provide months of hemodynamic support and is expected to allow for greater than five liters of blood flow per minute.

In April 2018, we announced that we received CE mark approval in the European Union for the Impella 5.5 heart pump and the first patient was treated at University Heart Center in Hamburg, Germany. The Impella 5.5 pump has not been approved for commercial use or sale in the U.S. We anticipate regulatory approval of the Impella 5.5 in the U.S. in calendar 2019.

Impella ECP™

The Impella ECP pump is designed for blood flow of greater than three liters per minute. It is intended to be delivered on a standard sized catheter and will include an expandable inflow in the left ventricle. We expect to conduct a first-in-human trial outside of the U.S. in calendar 2019. The Impella ECP pump is still in development and has not been approved for commercial use or sale.

Impella BTR™

The Impella BTR device is designed to be a percutaneous micro heart pump with integrated motors and sensors. The Impella BTR device is designed to be smaller, provide up to one year of hemodynamic support and is expected to allow for greater than five liters of blood flow per minute. The Impella BTR device also includes a wearable driver designed for hospital discharge. The Impella BTR pump is still in development and has not been approved for commercial use or sale.

Critical Accounting Policies and Estimates

There have been no significant changes in our critical accounting policies during the three and nine months ended December 31, 2018, as compared to the critical accounting policies disclosed in Management's Discussion and Analysis of Financial Condition and Results of Operations included in our Annual Report on Form 10-K for the fiscal year ended March 31, 2018.

Recent Accounting Pronouncements

Information regarding recent accounting pronouncements is included in "Note 2. Basis of Preparation and Summary of Significant Accounting Policies" to our consolidated financial statements and is incorporated herein by reference.

Results of Operations

The following table sets forth certain consolidated statements of operations data for the periods indicated as a percentage of total revenue:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
Revenue	100.0 %	100.0 %	100.0 %	100.0 %
Costs and expenses as a % of total revenue:				
Cost of revenue	17.0	16.2	16.8	16.3
Research and development	11.9	11.5	12.1	12.9
Selling, general and administrative	40.0	43.2	42.8	44.7
Total costs and expenses	68.9	70.9	71.7	73.9

Income from operations	31.1		29.1		28.3		26.1	
Income tax provision (benefit) and other, net	8.7		20.4		(4.6	)	8.1	
Net income as a % of total revenue	22.4	%	8.7	%	32.9	%	18.0	%

Three and Nine Months Ended December 31, 2018 compared with the Three and Nine Months Ended December 31, 2017

Revenue

Our revenues are comprised of the following:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
Impella product revenue	$193,253	$147,989	$542,198	$402,583
Service and other revenue	7,310	6,033	20,153	16,730
Total revenue	$200,563	$154,022	$562,351	$419,313

Our revenues are disaggregated by the following geographical locations:

	For the Three Months Ended December 31,		For the Nine Months Ended December 31,	
	2018	2017	2018	2017
	(in $000's)			
U.S. revenue	$172,548	$136,363	$488,386	$374,697
International revenue	28,015	17,659	73,965	44,616
Total revenue	$200,563	$154,022	$562,351	$419,313

Impella product revenue encompasses Impella 2.5, Impella CP, Impella 5.0, Impella LD, Impella RP and Impella AIC console sales. Service and other revenue represents revenue earned on service maintenance contracts and preventative maintenance calls.

Total revenue for the three months ended December 31, 2018 increased by $46.6 million, or 30%, to $200.6 million from $154.0 million for the three months ended December 31, 2017. Total revenue for the nine months ended December 31, 2018 increased $143.1 million, or 34%, to $562.4 million from $419.3 million for the nine months ended December 31, 2017. The increase in total revenue was primarily due to higher Impella product revenue from increased utilization in the U.S and Europe and our continued controlled commercial launch of Impella 2.5 and Impella 5.0 in Japan.

Impella product revenue for the three months ended December 31, 2018 increased by $45.3 million, or 31%, to $193.3 million from $148.0 million for the three months ended December 31, 2017. Impella product revenue for the nine months ended December 31, 2018 increased $139.6 million, or 35%, to $542.2 million from $402.6 million for the nine months ended December 31, 2017. Most of the increase in Impella product revenue was from increased device sales in the U.S., as we focus on increasing utilization of our disposable catheter products through continued investment in our field organization and physician training programs. Impella product revenue outside of the U.S. also increased primarily due to increased utilization in Germany and our continued controlled launch of Impella 2.5 and Impella 5.0 in Japan.

Service and other revenue for the three months ended December 31, 2018 increased by $1.3 million, or 22%, to $7.3 million from $6.0 million for the three months ended December 31, 2017. Service and other revenue for the nine months ended December 31, 2018 increased $3.5 million, or 21%, to $20.2 million from $16.7 million for the nine months ended December 31, 2017. The increase in service and other revenue was primarily due to an increase in preventative maintenance service contracts. We have expanded the number of Impella AIC consoles at many of our existing higher volume customer sites and continue to sell additional consoles to new customer sites. We expect growth for service and other revenue to be slower than our Impella product revenue in the future as most of these using sites in the U.S. have service contracts with three year terms.

Costs and Expenses

Cost of Revenue

Cost of revenue for the three months ended December 31, 2018 increased by $9.0 million, or 36%, to $34.0 million from $25.0 million for the three months ended December 31, 2017. Gross margin was 83.0% for the three months ended December 31, 2018 and 83.8% for the three months ended December 31, 2017.

Cost of revenue for the nine months ended December 31, 2018 increased by $26.2 million, or 38%, to $94.7 million from $68.5 million for the nine months ended December 31, 2017. Gross margin was 83.2% for the nine months ended December 31, 2018 and 83.7% for the nine months ended December 31, 2017.

The increase in cost of product revenue was related to higher demand for our Impella devices and higher production volume and costs to support growing demand for our Impella devices. The decrease in gross margin for the three and nine months ended December 31, 2018 was due to higher volume offset by increased investment in direct labor and overhead as we expand our manufacturing capacity to support expected growth in our Impella business.

Research and Development Expenses

Research and development expenses for the three months ended December 31, 2018 increased by $6.3 million, or 36%, to $24.0 million from $17.7 million for three months ended December 31, 2017. Research and development expense for the nine months ended December 31, 2018 increased $14.0 million, or 26%, to $68.0 million from $54.0 million for the nine months ended December 31, 2017. The increase in research and development expenses was primarily due to product development initiatives relating to our existing products, such as optical sensor technology, on the development of Impella 5.5™, Impella BTR™ and Impella ECP™ devices, the expansion of our engineering organization, increased clinical spending primarily related to our cVAD registry and STEMI trial and our continued focus on quality initiatives for our Impella devices.

We expect research and development expenses to increase for the remainder of fiscal 2019 as we continue to increase clinical spending related to our cVAD Registry, launch the pivotal STEMI trial and other clinical trials. We also expect to incur additional costs as we continue to focus on engineering initiatives to improve our existing products and develop new technologies.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for the three months ended December 31, 2018 increased by $13.6 million, or 20%, to $80.2 million from $66.6 million for the three months ended December 31, 2017. Selling, general, and administrative expenses for the nine months ended December 31, 2018 increased $53.1 million, or 28%, to $240.3 million from $187.2 million for the nine months ended December 31, 2017. The increase in selling, general and administrative expenses was primarily due to the hiring of additional field sales and clinical personnel in the U.S. and Germany, our continued commercial launch in Japan, increased spending on marketing initiatives as we continue to educate U.S. physicians on the benefits to patients of hemodynamic support with our Impella products following PMAs, stock-based compensation expense, higher payroll taxes associated with stock option exercises and restricted stock unit vestings and legal expenses related to ongoing patent litigation and other legal matters discussed in “Note 11. Commitments and Contingencies—Litigation” to our consolidated financial statements.

We expect to continue to increase our expenditures on sales and marketing activities, with particular investments in field sales and clinical personnel with cath lab expertise to drive recovery awareness for acute heart failure patients. We also plan to increase our marketing, service and training investments as a result of recent PMAs in the U.S. for our Impella devices and as we continue our expansion in Japan and other new markets outside of the U.S. We expect to have higher stock-based compensation expense due to the grant of recent equity awards at a higher stock price. We also expect to continue to incur significant legal expenses for the foreseeable future related to ongoing patent litigation and other legal matters discussed in “Note 11. Commitment and Contingencies – Litigation,” to our consolidated financial statements.

Income Tax Provision

Our income tax provision was $19.6 million for the three months ended December 31, 2018 and our income tax benefit was $20.2 million for the nine months ended December 31, 2018. Our income tax provision was $32.2 million and $36.6 million for the three and nine months ended December 31, 2017, respectively. Our effective tax rate was 30.5% and (12.3)% for the three and nine months ended December 31, 2018, respectively, and 70.6% and 32.7% for the three and nine months ended December 31, 2017, respectively. The decrease in the effective income tax rate for the three months ended December 31, 2018 was due primarily to the writeoff of $22.0 million in deferred tax assets with lower U.S. income tax rate with the enactment of the Tax Reform Act in December 2017. The decrease in the effective income tax rate for the nine months ended December 31, 2018 was primarily due to excess tax benefits recognized associated with stock-based awards of $68.5 million during the nine months ended December 31, 2018 compared with $24.5 million for the nine months ended December 31, 2017. In addition, effective January 1, 2018, the Tax Reform Act, among other changes, reduced the U.S. federal statutory corporate income tax rate from 35% to 21%.

Net Income

For the three months ended December 31, 2018, net income was $44.9 million, or $1.00 per basic share and $0.97 per diluted share, compared to $13.4 million, or $0.30 per basic share and $0.29 per diluted share for three months ended December 31, 2017. For the nine months ended December 31, 2018, net income was $185.1 million, or $4.13 per basic share and $4.01 per diluted share, compared to $75.3 million, or $1.71 per basic share and $1.65 per diluted share for the nine months ended December 31, 2017. As discussed above, the enactment of the Tax Reform Act

resulted in a decrease in net income of $22.0 million, or $0.50 per basic and $0.48 per diluted share for the three and nine months ended December 31, 2017. Our net income included excess tax benefits of $0.04 per basic and diluted share for the three months ended December 31, 2018 compared to $0.07 per basic and diluted share for the three months ended December 31, 2017. Our net income included excess tax benefits of $1.53 per basic share and $1.48 per diluted share for the nine months ended December 31, 2018 compared to $0.56 per basic share and $0.54 per diluted share for the nine months ended December 31, 2017.

Our net income for fiscal 2019 was also driven by higher product revenue due to greater utilization of our Impella devices in the U.S., Germany and Japan.

Liquidity and Capital Resources

At December 31, 2018, our total cash, cash equivalents and marketable securities totaled $458.2 million, an increase of $58.4 million compared to $399.8 million at March 31, 2018. The increase in our cash, cash equivalents and marketable securities during the nine months ended December 31, 2018 was primarily due to positive cash flows from operations.

Following is a summary of our cash flow activities:

	For the Nine Months Ended December 31,	
	2018	2017
Net cash provided by operating activities	$181,806	$136,147
Net cash used for investing activities	(80,701)	(112,307)
Net cash used for financing activities	(58,794)	(11,688)
Effect of exchange rate changes on cash	(1,105)	(690)
Net increase in cash and cash equivalents	$41,206	$11,462

Cash Provided by Operating Activities

For the nine months ended December 31, 2018, cash provided by operating activities consisted of net income of $185.1 million, adjustments for non-cash items of $29.8 million and cash used in working capital of $33.1 million. The increase in net income was primarily due to higher revenue from increased utilization of our Impella devices. Adjustments for non-cash items consisted primarily of $43.8 million of stock-based compensation expense, a $26.0 million change in deferred tax provision, $9.9 million of depreciation and amortization expense, $3.2 million in inventory and other write-downs, and $1.6 million in accretion on marketable securities. Cash used in working capital consisted of a $19.3 million increase in accounts receivable due to increased sales and a $26.5 million increase in inventory to support growing demand for our Impella devices, offset by an $11.8 million increase in accounts payable and accrued expenses primarily due to increased expenditures.

For the nine months ended December 31, 2017, cash provided by operating activities consisted of net income of $75.3 million, adjustments for non-cash items of $76.5 million and cash used in working capital of $15.7 million. The increase in net income was primarily due to higher revenue from increased utilization of our Impella devices. Adjustments for non-cash items consisted primarily of $29.2 million of stock-based compensation expense, a $34.7 million change in deferred tax provision due to the revaluation of our net deferred tax assets related to the Tax Reform Act, $8.1 million of depreciation expense on property and equipment and $3.2 million in inventory and other asset write-downs. The change in cash from working capital included a $10.3 million increase in accounts receivable associated with higher revenue, $12.0 million increase in inventory to support growing demand for our Impella devices, a $6.5 million increase in accounts payable and accrued expenses and a $1.2 million increase in deferred revenue.

Cash Used for Investing Activities

For the nine months ended December 31, 2018, net cash used for investing activities primarily consisted of $14.8 million in purchases (net of maturities) of marketable securities and $35.5 million for the purchase of property and equipment primarily related to continued expansion of manufacturing capacity, office space and research and development facilities in Danvers, Massachusetts and Aachen, Germany. We also made $30.4 million of investments in other assets and intangible assets.

For the nine months ended December 31, 2017, net cash used for investing activities primarily consisted of $61.7 million in purchases (net of maturities) of marketable securities and $44.2 million for the purchase of property and equipment primarily related to the purchase of our corporate headquarters building in Danvers, Massachusetts during the three months ended December 31, 2017 and the continued expansion of manufacturing capacity, office space and

research and development facilities in Danvers and Aachen, Germany. We also have made $6.4 million of investments in private medical technology companies during fiscal 2018.

Capital expenditures for fiscal 2019 are estimated to range from $45 million to $50 million, including additional capital expenditures for manufacturing capacity expansions in our Danvers, Massachusetts and Aachen, Germany facilities, additional office space, building and leasehold improvements and information systems development projects.

Cash Used for Financing Activities

For the nine months ended December 31, 2018, net cash used for financing activities included $71.2 million in payments in lieu of issuance of common stock for payroll withholding taxes upon vesting of certain equity awards. This amount was offset by $11.0 million in proceeds from the exercise of stock options and $1.4 million in proceeds from the issuance of stock under the employee stock purchase plan.

For the nine months ended December 31, 2017, net cash used for financing activities included $19.9 million in payments in lieu of issuance of common stock for payroll withholding taxes upon vesting of certain equity awards and $0.5 million in principal payments on capital lease obligation. The capital lease obligation previously recorded was removed as a result of the acquisition of our headquarters in October 2017. These amounts were offset by $7.6 million in proceeds from the exercise of stock options and $1.1 million in proceeds from the issuance of stock under the employee stock purchase plan.

Operating Capital and Liquidity Requirements

We believe that our revenue from product sales together with existing resources will be sufficient to fund our operations for at least the next twelve months, exclusive of activities involving any future acquisitions of products or companies that complement or augment our existing line of products.

Our primary liquidity requirements are to fund the expansion of our commercial and operational infrastructure, increase our manufacturing capacity, increase our inventory levels in order to meet growing customer demand for our Impella devices, fund new product development initiatives, continue our controlled commercial launch of Impella devices in Japan and expand to potential new markets, increase clinical spending, legal expenses related to ongoing patent litigation, payments in lieu of issuance of common stock for payroll withholding taxes upon vesting of certain equity awards and to provide for general working capital needs. To date, we have primarily funded our operations through product sales and the sale of equity securities.

Our liquidity is influenced by our ability to sell our products in a competitive industry and our customers' ability to pay for our products. Factors that may affect liquidity include our ability to penetrate the market for our products, maintain or reduce the length of the selling cycle for our products, capital expenditures, investments in collaborative arrangements with other partners, and our ability to collect cash from customers after our products are sold. We also expect to continue to incur legal expenses for the foreseeable future related to ongoing patent litigation and other legal matters. We continue to review our short-term and long-term cash needs on a regular basis. At December 31, 2018 we had no long-term debt outstanding.

Marketable securities at December 31, 2018 and March 31, 2018 consisted of $374.0 million and $356.8 million, respectively, held in investment funds that invest in U.S. Treasury, government-backed and corporate debt securities, and commercial paper. We are not a party to any interest rate swaps, currency hedges or derivative contracts of any type and have no exposure to auction rate securities markets.

Cash and cash equivalents held by our foreign subsidiaries totaled $22.6 million and $13.3 million at December 31, 2018 and March 31, 2018, respectively. Our operating income outside the U.S. is deemed to be permanently reinvested in foreign jurisdictions. Since most of our cash and cash equivalents held by foreign subsidiaries which are disregarded entities for domestic tax purposes, any repatriation of foreign subsidiary earnings to the U.S. would likely have a nominal tax impact.

ITEM 3: QUANTITATIVE AND QUALITATIVE DISCLOSURE ABOUT MARKET RISK

Primary Market Risk Exposures

Our cash, cash equivalents and marketable securities are subject to interest rate risk and will fall in value if market interest rates increase. If market interest rates were to increase immediately and uniformly by 10% from levels at December 31, 2018, we believe the decline in fair market value of our investment portfolio would be immaterial.

Currency Exchange Rates

We have foreign currency exposure to exchange rate fluctuations and particularly with respect to the Euro, British pound sterling, Japanese yen and Singapore dollar. Therefore, our investment in our subsidiaries is sensitive to fluctuations in currency exchange rates. The effect of a change in currency exchange rates on our net investment in international subsidiaries is reflected in the accumulated other comprehensive (loss) income component of stockholders' equity. If rates of exchange for these currencies noted above were to have depreciated by 10% relative to the U.S. dollar from levels at December 31, 2018, the result would have been a reduction of stockholders' equity of approximately $11.8 million.

Fair Value of Financial Instruments

At December 31, 2018, our financial instruments consist primarily of cash and cash equivalents, marketable securities, accounts receivable, accounts payable and contingent consideration. The carrying amounts of accounts receivable and accounts payable are considered reasonable estimates of their fair value, due to the short maturity of these instruments. The estimated fair values of the financial instruments have been determined by us using available market information and appropriate valuation techniques. Considerable judgment is required, however, to interpret market data to develop the estimates of fair value. The use of different market assumptions and/or estimation methodologies may have a material effect on the estimated fair value amounts.

ITEM 4. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

Our management, with the participation of our principal executive officer and principal financial officer, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act), as of December 31, 2018. Based on this evaluation, our principal executive officer and principal financial officer concluded that, as of December 31, 2018, these disclosure controls and procedures are effective to provide reasonable assurance that material information required to be disclosed by us, including our consolidated subsidiaries, in reports that we file or submit under the Exchange Act, is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act 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.

Evaluation of Changes in Internal Control over Financial Reporting

During the third quarter of our fiscal year ending March 31, 2019, there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II — OTHER INFORMATION

Item 1. Legal Proceedings

We are from time to time involved in various legal actions, the outcomes of which are not within our complete control and may not be known for prolonged periods of time. In some actions, the claimants seek damages, as well as other relief, which, if granted, would require significant expenditures and could impair our business and results of operations. Material legal proceedings are discussed in "Note 11. Commitments and Contingencies—Contingencies" to our consolidated financial statements and such information is incorporated herein by reference.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. In addition to the other information set forth in this Report, you should carefully consider the factors discussed in Part I, "Item 1A. Risk Factors" in our Annual Report on Form 10-K for the year ended March 31, 2018, which could materially affect our business, financial condition or future results. As of the date of this Report there has been no material change in any of the risk factors described in our Annual Report on Form 10-K for the fiscal year ended March 31, 2018.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

(a) Not applicable.

(b) Not applicable.

(c) Not applicable.

Item 3. Defaults Upon Senior Securities

None

Item 4. Mine Safety Disclosures

Not applicable.

Item 5. Other Information

Effective February 5, 2019, the Company's Board of Directors adopted Amendment No. 1 to the Company's Amended and Restated By-Laws. The sole purpose of Amendment No. 1 is to update Section 1.1 of the By-Laws to provide the Board of Directors flexibility to fix the date of the Company's annual meeting of stockholders, which the By-Laws previously fixed as the second Wednesday of August in each year. The full text of Section 1.1, as amended, reads as follows:

Annual Meeting. An annual meeting of the stockholders for the election of directors to succeed those whose terms expire and for the transaction of such other business as may properly come before the meeting shall be held at the place, if any, within or without the State of Delaware, on the date and at the time that the board of directors shall each

year fix. Unless stated otherwise in the notice of the annual meeting of the stockholders of the corporation, such annual meeting shall be at the principal office of the corporation.

A copy of Amendment No. 1 is filed with Exhibit 3.2 to this Report and is incorporated into this Item 5 by reference.

Item 6. Exhibits

Exhibit No.	Description	Filed with This Form 10-Q	Incorporated by Reference		
			Form	Filing Date	Exhibit No.
2.1	Agreement on the Sale and Transfer of all shares in ECP Entwicklungsgellschaft mbH		8-K	July 7, 2014 (File No. 001-09585)	2.1
2.2	Agreement on the Sale and Transfer of all shares in AIS GmbH Aachen Innovation Solutions		8-K	July 7, 2014 (File No. 001-09585)	2.2
3.1	Restated Certificate of Incorporation.		S-3	September 29, 1997	3.1
3.2	Amended and Restated By-Laws, as amended.	X			
3.3	Certificate of Designations of Series A Junior Participating Preferred Stock.		S-3	September 29, 1997	3.3
3.4	Amendment to the Company's Restated Certificate of Incorporation to increase the authorized shares of common stock from 25,000,000 to 100,000,000.		8-K	March 21, 2007 (File No. 001-09585)	3.4
10.1	Lease agreement amendment for additional space in Danvers, Massachusetts dated July 23, 2018		10-Q	August 2, 2018 (File No. 001-09585)	10.1
31.1	Principal Financial Officer Certification pursuant to Securities Exchange Act Rule 13a-14(a) and 15d-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X			
31.2	Principal Financial Officer Certification pursuant to Securities Exchange Act Rule 13a-14(a) and 15d-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.	X			
32.1	Principal Executive Officer and Principal Financial Officer Certifications pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.	X			

101	The following financial information from the ABIOMED, Inc. Quarterly Report on Form 10-Q for the quarter ended December 31, 2018, formatted in Extensible Business Reporting Language (XBRL): (i) Condensed Consolidated Balance Sheets as of December 31, 2018 and March 31, 2018; (ii) Condensed Consolidated Statements of Operations for the three and nine months ended December 31, 2018 and 2017; (iii) Condensed Consolidated Statements of Comprehensive Income for the three and nine months ended December 31, 2018 and 2017; (iv) Condensed Consolidated Statements of Cash Flows for the nine months ended December 31, 2018 and 2017; and (v) Notes to Condensed Consolidated Financial Statements.	X

ABIOMED, INC. AND SUBSIDIARIES

PART II. OTHER INFORMATION

SIGNATURES

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.

ABIOMED, Inc.

Date: February 5, 2019 /s/ TODD A. TRAPP
Todd A. Trapp
Vice President and Chief Financial Officer
(Principal Financial and
Accounting Officer)