BerkeleyHaas Case Series
Haas School of Business
University of California Berkeley

B5979

Date: July 1, 2021

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Using Data Analytics and Visualization in Accounting and Auditing at Toby Biotech Inc.

"The real voyage of discovery consists not in seeking new landscapes, but in having new eyes."

—MARCEL PROUST
FRENCH NOVELIST, ESSAYIST, AND CRITIC

Client Background

Toby Biotech Inc.[1], is a publicly held corporation that specializes in the manufacturing of instruments, software, and services that have laboratory workflow applications in the life sciences, medical diagnostics, and educational research industries.

Based in California's Biotech Bay, Toby is currently listed as a Fortune 500 company and it serves businesses, research centers, and universities around the world, with sales offices located in Berkeley, California; Toronto, Canada; London; Hong Kong; and Singapore. It has manufacturing plants in Bangkok, Thailand; Kuala Lumpur, Malaysia; Hong Kong; Toronto, Canada; and Austin, Texas that focus on the production of its products. Toby sells its products primarily through direct sales out of its regional sales offices, but it also utilizes distributors and electronic commerce. It has approximately 14,800 employees—excluding contract manufacturer workers.

In addition to manufacturing its instruments, Toby manufacture supplies for use in its instruments, provides consulting to customers on how to manage their instruments, performs repair and maintenance services for the instruments, and builds the software used within the instruments—all representing separate and additional revenue streams.

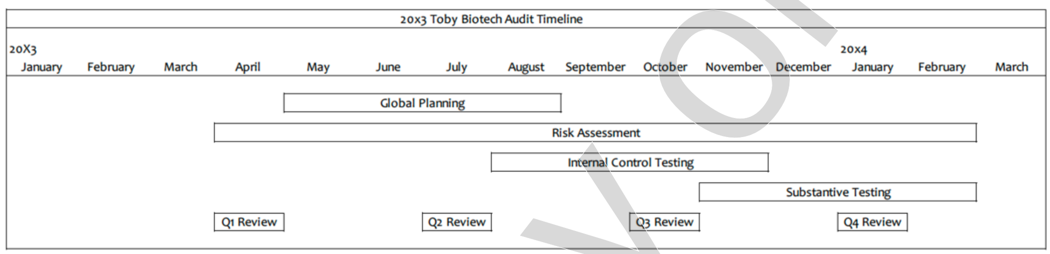
[1] A fictitious company.

Lecturer Tiffany Rasmussen prepared this case, with assistance from Case Writer Dickson L. Louie and BerkeleyHaas doctoral student Kimberlyn George, as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

For the year ended December 31, 20X3, Toby's unaudited income before taxes is $218 million on net sales revenue of $1.132 billion. After a provision for income taxes, net income is $185 million (see **Exhibit 1** for income statements). Instrument sales account for approximately 75% of Toby's revenue, while supplies, consulting, software and services make up the balance.

Situation

Figure 1 20X3 Toby Biotech Audit Timeline



Source: Case writing team

In early 20X4, the annual audit of Toby's 20X3 financial statements is well underway, conducted by TRG LLP, a global public accounting firm's office in Oakland, California. For the past several months the audit team has been planning the audit, assessing risks and testing Toby's internal controls (see **Figure 1** above). The team is now preparing for a face-to-face meeting with the client team to discuss areas of substantive risk within the company's financial statement audit.

During the past 18 months, the global economy has begun to experience a slowdown—after 12 straight years of economic growth—with the Pacific Rim nations of China, South Korea, and Japan now in the midst of an ongoing recession. As economists had projected, this economic slowdown impacted Europe near year-end 20X3, before extending to the United States and Canada at the start of 20X4.

As a result of this economic slowdown, a few areas of focus for the audit team include accounts receivable (AR) and the related allowance for credit losses (ACL) on its balance sheet and the corresponding bad debt expense on its income statement. Also in focus is the reserve for returns and allowances (RRA) and its impact on AR, revenue, inventory and cost of goods sold (COGS). Several of Toby's instrument customers have recently experienced a reduction in cash flow, due to depressed year-over-year sales, and have asked Toby if they can pay in installments. There has also been an increase in returns and Toy has provided allowances as a result of the slowdown in many customers' businesses.

The December 31, 20X3 AR balance for Toby is $177 million (see **Exhibit 2** for balance sheets), an increase of $19 million, or 12 percent, over the year-end balance from the prior year and somewhat higher than the comparative 10 percent year-over-year growth in sales revenue (see **Exhibit 1** for income statement). One key question for the TRG audit team is whether this year-end AR balance is materially reflective of what Toby can realistically and ultimately expect to collect or, if not, how much the ACL and bad debt expense should be increased? Another question the TRG audit team must ask is, how will the global economic changes and any changes in Toby's business impact Toby's RRA?

Due to the economic related risks already mentioned, TRG has preliminarily assessed materiality for the year at four percent (less than the five percent threshold commonly used by SEC registrants and auditors) of Income Before Taxes or $8.72 million. According to SEC Staff Accounting Bulletin No. 99 (SAB 99), materiality need not follow the recommended five percent benchmark, if there are strong reasons to lower the threshold. SAB 99 states:

> *Materiality concerns the significance of an item to users of a registrant's financial statements. A matter is "material" if there is a substantial likelihood that a reasonable person would consider it important. …the Financial Accounting Standards Board (FASB) stated the essence of the concept of materiality as follows:*
>
> *The omission or misstatement of an item in a financial report is material if, in the light of surrounding circumstances, the magnitude of the item is such that it is probable that the judgment of a reasonable person relying upon the report would have been changed or influenced by the inclusion or correction of the item.*[2]

The Client and Audit Team

The client team—the chief financial officer (Sage), controller (Duncan), and chief revenue officer (Taylor)—believe that the existing net AR balance is appropriately valued, but are willing to discuss any inquiries the TRG audit team—the partner (Jordan), manager (Aaron), senior associate (Cameron), and associate (Quinn)—may have.

On a typical audit team, the audit partner represents the independent accounting firm—the partner has an ownership stake in the firm—and is responsible for issuing the firm's audit opinion on the client's financial statements each year to its board of directors and shareholders. The client's financial statements include five key statements—the income statement, comprehensive income statement, balance sheet, shareholders' equity statement, and cash flows statement—and the accompanying notes that provide required disclosures. The firm's audit opinion addresses whether the financial statements present fairly, in all material respects, the financial position of a company in conformity with generally accepted accounting principles (GAAP). The audit partner typically has access to the client's board, usually through an outside director, who serves as the head of the audit committee. The audit partner oversees the planning, execution and review of the audit work, concludes on the adequacy of the audit evidence, and signs the audit opinion.

The audit manager is responsible for putting together the annual audit plan, overseeing all of the audit testing of the client's financial records, and the operations of the audit team, including staffing. The audit manager also reviews the working papers, financial statements, and the audit report, making key audit recommendations to the partner.

Assisting the audit manager are usually at least a senior associate and an associate, who perform the audit procedures to gather and evaluate audit evidence. Both are responsible for reporting to

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[2] U.S. Securities and Exchange Commission Staff Accounting Bulletin 99 (SAB 99), https://www.sec.gov/interps/account/sab99.htm

their supervisor any auditing or accounting issues encountered. The senior associate assists in the audit plan development, assigns tasks to associates, and directs the day-to-day operation of the audit team. The associate performs the audit procedures assigned and prepares appropriate documentation of the completed work.

An audit manager usually has about five years of audit experience; the senior associate, two-to-four years; and the associate, two years or less.

The Audit Planning Meeting

Just after year-end 20X3, the audit team consisting of Jordan (partner), Aaron (manager) and Cameron (senior) met in one of the firm's conference rooms to discuss the potential substantive audit risk areas of Toby.

"With the slowdown in the global economy, we'll need to be more skeptical about how Toby is reporting its revenue and net income," said Jordan, "especially in the areas of revenue recognition and the related areas of allowances for credit losses and reserve for returns and allowances." Jordan then cited the many understated loan loss allowances during the financial crisis of 2008 and her concern that Toby might be incented to increase its net income by underestimating its allowance for credit losses and reserve for returns and allowances.

"As a reminder, within ASC 326[3]," added Jordan, "CECL estimates should consider all receivables and be based on all relevant information, including historical experience, current conditions, and reasonable and supportable forecasts."

The current expected credit loss (CECL) model was developed after the global financial crisis of 2008-09 because of a concern that the preexisting approach could understate bad debt expense. The "probable" threshold for identifying bad debts means that sellers don't record an estimate of bad debts that they view as only possible. Also, basing estimates only on events that already have occurred could ignore forecasts of future economic conditions that suggest impending problems. Given these differences, it is likely that bad debts accruals will be larger under the CECL model than under preexisting GAAP.

Both Aaron and Cameron agreed.

Cameron added: "We tested Toby's internal controls prior to year-end and no deficiencies were noted related to the revenue and accounts receivable process."

"Considering our ability to rely on internal controls and acknowledging the inherent risks we've discussed," said Aaron as he wrote down Jordan's comments. "Both Cameron and I will put together a revenue and accounts receivable substantive audit program that will focus on these sensitive areas."

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[3] Financial Accounting Standards Board (FASB) Accounting Standard Codification (ASC) 326 on Financial Instruments—Credit Losses. https://asc.fasb.org/ (subscription or access code required)

In addition, the audit team plans to use key financial statement ratios—such as Sales growth vs. Accounts Receivable growth, Accounts Receivable Turnover, Days Sales in Accounts Receivable, Returns and Allowances as percentages of Sales—to identify trends and risks.

Audit Process and Parameters

With the revenue and accounts receivable audit program being drafted, the audit team is performing its risk assessment over the net accounts receivable (AR) balance, allowance for credit losses (ACL) and reserve for returns and allowances (RRA). The audit team will use Tableau data visualization to assist in the risk assessment and perform the steps below (see accompanying "Student Instructions for Tableau" for more detailed instructions):

- Obtain the AR subledger from their client and download into Tableau workbooks;
- Create Tableau visuals to highlight areas of risk and follow up;
- Formulate questions to ask the client about AR, its collectibility, the ACL and RRA and any revenue recognition concerns; and
- Prepare a revenue and accounts receivable substantive audit program.

Scheduled Meeting with the Client

A week after the audit team performed its review of the AR subledger and had developed several Tableau visualizations of Toby's AR, ACL, RRA data, a meeting was scheduled with Toby's senior financial team consisting of Sage (the chief financial officer), Duncan (controller) , and Taylor (chief revenue officer). Jordan, Aaron, and Cameron would be representing the audit team at the meeting. Cameron joined TRG after graduating from the Haas School of Business at the University of California, Berkeley, and was a star student in the audit class there, so he's well prepared for this meeting.

The audit team had a number of questions for the senior financial team, several of which could impact Toby's 20X3 financial statements under audit.

The meeting was not expected to be an easy one. With 100 million shares of common stock outstanding, an increase of $10 million in bad debt expense and RRA would result in lower reported annual earnings per share (EPS) of $0.08. At the moment, without any adjustments to the existing unaudited year-end financial statements, the year-end EPS would just meet the consensus expectations of the Wall Street financial analysts.

In addition, Toby was also in the midst of raising a new round of debt financing—taking advantage of the Federal Reserve's recent reduction of the fund rate due to the current economic slowdown—with the issuance of corporate bonds that would provide the company with additional liquidity. Any increase to the ACL or RRA could create negative publicity for the company, impact its Standard & Poor's "low risk, investment grade" A corporate credit rating[4], and affect its stock price. The audit team knows that Sage, who had worked previously as a partner at Kirby & Kirby, a noted investment bank, was in the process of personally negotiating the terms of the

[4] Standard & Poor's has several letter grades for bond ratings. See "What Is Standard and Poor's (S&P)?" for more details. https://www.thebalance.com/what-are-sandp-credit-ratings-and-scales-3305886

new corporate bonds with several banks. Any negative adjustment to Toby's revenue, ACL or RRA would increase Toby's cost of borrowing, which Sage is trying to avoid.

Toby is scheduled to release its year-end earnings by the end of next month and its chief executive officer (CEO) Anna would like to announce that the company is currently "weathering the storm" against the global economic slowdown.

Instructions

- The class will be divided up into teams of 3-4 students.

- All teams will use Tableau (www.tableau.com) to perform a risk assessment and data visualization of the key audit areas of the company's AR, ACL and RAA by diving into the company's raw data related to these areas. Please see the separate "**Student Instructions for Tableau**" for a step-by-step guide on how to use Tableau for this exercise.
- Utilize the Excel "**AR Subledger.xlsx**" and the Tableau workbooks "**Customer Balance.twb, Invoices.twb, Returns.twb, and Allowances.twb**" to access the case data.

The audit risk assessment process will include:

  - Using the AR subledger provided by the client, which has already been tested for completeness and accuracy, so can be relied upon for this audit procedure, **create visuals** to share with the client and **formulate questions to ask the client** about its AR, ACL, RAA and revenue recognition, as highlighted by the analysis;
  - The objective of the analysis is to **further focus the substantive procedures** to be performed by the audit team; and
  - Although most of the related control tests have already been performed, these visuals **may highlight areas for additional control tests** as well.

- Each team prepares Tableau data visualizations and client questions prior to role play.

- Each team role plays as the audit team, with the professor (and teaching assistant, if available) playing the role of client, and the class observing.

- In the role play, the audit team **discusses their questions** and **shares their visualizations** with the client team. The goal is to assess risks of material misstatement and focus substantive, and if warranted, control procedures.

- The client team will use the data provided in the case notes to address the audit team's questions. The client believes their AR, net and net revenue are fairly stated.

- By the end of the role plays, the teams will **fill out the Client Meeting Notes grid** on the next page and **debrief the exercise** with the class.

Client Meeting Notes Grid

Toby Biotech Inc. Audit
December 31, 20x3
Client Meeting re: Accounts Receivable, net

Team Members' Names:

	Revenue Recognition	Allowance for Credit Losses	Reserve for Returns and Allowances
Risks of Material Misstatement Highlighted			
Questions for the Client			
Client Responses			
Follow-up Audit Procedures – Control			
Follow-up Audit Procedures – Substantive			

Source: Author

Exhibit 1 Toby Biotech Inc. Income Statements

Toby Biotech Inc.
Consolidated Income Statements (UNAUDITED)
(dollars in millions)

			12/31/20X3	% of Revenue	12/31/20X2	% of Revenue	12/31/20X1	% of Revenue
Net revenue:								
Products			$ 849	75%	$ 778	76%	$ 691	75%
Services and other			283	25%	252	24%	230	25%
Total net revenue	*Year over Year Growth*	*10%*	1,132	100%	1,029	100%	921	100%
Costs and Expenses:								
Cost of products			366	32%	336	33%	319	35%
Cost of services and other			147	13%	138	13%	120	13%
Total costs			513	45%	474	46%	439	48%
Research and development			89	8%	78	8%	72	8%
Selling, general and administrative			317	28%	283	28%	275	30%
Total costs and expenses			919	81%	835	81%	786	85%
Income from operations			213	19%	194	19%	135	15%
Interest income			9	1%	5	0%	2	0%
Interest expense			(17)	-2%	(18)	-2%	(16)	-2%
Other income (expense)			13	1%	4	0%	(2)	0%
Income before taxes	*Materiality $*	*8.72*	218	19%	185	18%	119	13%
Provision for income taxes			33	3%	27	3%	18	2%
Net income			$ 185	16%	$ 158	15%	$ 101	11%
Net income per share								
Basic			$ 1.85		$ 1.58		$ 1.01	
Diluted			$ 1.76		$ 1.52		$ 0.98	

Accounts Receivable Operating Ratios		
Revenue	$ 1,132	$ 1,029
Average Accounts receivable, net	$ 168	$ 150
Accounts receivable, net Turnover	6.76	6.88
Days Sales in Accounts receivable, net	54	53

Source: Case writing team

Exhibit 2 Toby Biotech Inc. Balance Sheets

Toby Biotech Inc.
Consolidated Balance Sheets (UNAUDITED)
(dollars in millions)

		12/31/20X3		12/31/20X2		12/31/20X1	
			% of Assets		*% of Assets*		*% of Assets*
ASSETS							
Current assets:							
Cash and cash equivalents		$ 517	28%	$ 591	32%	$ 521	29%
Accounts receivable, net of Allowance for Credit Losses and Reserve for Returns and Allowances	*Year over Year Growth* 12%	177	9%	158	9%	141	8%
Inventory		147	8%	127	7%	121	7%
Other current assets		43	2%	42	2%	41	2%
Total current assets		884	47%	918	49%	824	47%
Property, plant and equipment, net		189	10%	167	9%	146	8%
Goodwill		601	32%	576	31%	573	32%
Other intangible assets		83	4%	80	4%	95	5%
Long-term investments		32	2%	30	2%	31	2%
Other assets		91	5%	87	5%	103	6%
Total assets		$ 1,880		$ 1,858		$ 1,772	
LIABILITIES AND EQUITY							
Current liabilities:			*% of Liabilities*		*% of Liabilities*		*% of Liabilities*
Accounts payable		$ 77	9%	$ 69	8%	$ 59	7%
Employee compensation and benefits		69	8%	63	8%	54	7%
Deferred revenue		74	8%	66	8%	61	8%
Short-term debt		0	0%	48	6%	0	0%
Other accrued liabilities		46	5%	41	5%	42	5%
Total current liabilities		266	29%	287	35%	216	27%
Long-term debt		409	45%	410	50%	434	54%
Retirement and post-retirement benefits		54	6%	53	6%	82	10%
Other long-term liabilities		173	19%	67	8%	77	10%
Total liabilities		903		817		809	
Commitments and contingencies (Note X)							
Total equity:							
Stockholders' equity:			*% of Equity*		*% of Equity*		*% of Equity*
Common stock ($0.01 par value, 500 million shares authorized, 100 million shares outstanding)		1	0%	1	0%	1	0%
Treasury stock		0	0%	0	0%	(2,391)	-248%
Additional paid-in-capital		1,236	116%	1,144	110%	2,084	216%
Accumulated deficit		(78)	-7%	(27)	-3%	1,385	143%
Accumulated other comprehensive loss		(95)	-9%	(75)	-7%	(114)	-12%
Total stockholders' equity		1,064	100%	1,043	100%	965	100%
Non-controlling interest		1	0%	1	0%	1	0%
Total equity		1,064		1,044		966	
Total liabilities and equity		$ 1,967		$ 1,861		$ 1,775	

Source: Case writing team