

# CONSTRUCTING A CASH BUDGET AND PROJECTING FINANCIAL STATEMENTS: AN EXERCISE OF SHORT-TERM FINANCIAL PLANNING FOR ENTREPRENEURS

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## CASE DESCRIPTION

*This case presents a teaching tool that equips students with an essential skill of short-term financial planning for entrepreneurs. Short-term financial planning concentrates on a venture's cash needs, the lifeblood of an entrepreneurial venture, so these ventures can better survive the early stages of operations. In this case, students are required to build up a cash budget by utilizing payment schedules of sales, inventory purchases and wage-and-commissions. Other tasks demanded by this challenging case include projecting the following: monthly income statements, balance sheets and statements of cash flows over a four-month period. Students who take on this case should possess a solid understanding of the interrelationship among income statements, balance sheets and statements of cash flows. This case is suitable for a graduate-level finance course or an upper-level undergraduate class of entrepreneurship in either finance or accounting departments. Students might be assigned to work individually or in groups on this case. Completion of the case requires 10-15 hours outside of class. Class discussion should be about 2-3 hours.*

**JEL:** M13, M41

**KEYWORDS:** Entrepreneurial Finance, Cash Budget, Financial Statements

## CASE INFORMATION

John Smith is the founder and owner of the Best Oxygen Corporation, which has only recently begun operations. It offers the following products: (1) home-based oxygen concentrators; (2) portable oxygen systems; and (3) oxygen concentrator components and accessories. Some of its products are equipped with patent-protected technologies owned by Best Oxygen. Smith believes that the products Best Oxygen provides, along with its patents, are unique and can create a successful business model.

Best Oxygen started its sales with a modest amount of inventory in March and generated revenue of \$82,000. It is currently March 31, 2013, and the following table reflects actual sales for March and the sales department's projected sales for the next five months.

Month:	Sales (US\$)
March (actual sales)	\$82,000
April	\$105,000
May	\$174,000
June	\$128,000
July	\$105,000
August	\$82,000

In addition,

- (1) Best Oxygen will spend \$5,900 cash to buy a delivery truck on April 1.
- (2) The Company expects to pay miscellaneous cash expenses equal to 5% of the current sales.
- (3) The current location costs Best Oxygen \$3,600 per month for rent.

- (4) The insurance policy costs \$400 per month and Best Oxygen has fully paid its one-year policy on March 31, 2013. Best Oxygen will not write another check to pay for insurance prior to the expiration of the current policy. Prepaid insurance on March 31 therefore amounts to \$4,800.
- (5) Depreciation is estimated to be \$1,050 per month, including the truck.
- (6) Best Oxygen does not anticipate paying any tax expense.
- (7) Wage expense is a fixed payment of \$5,750 per month. It is paid twice a month. The first payment is disbursed in the middle of month and the second payment falls on the first day of the following month. (Note: The first of the two payments made each month is thus the second payment from the previous month.) In addition, 15% of sales are paid as a variable commission for each salesperson. These commissions are likewise paid twice per month, first in the middle of the current month and then on the first day of the following month. (Note: For ease of calculation, assume that each commission payment is for half of the commission owed for the appropriate month.)
- (8) Best Oxygen's inventory policy is to begin a month with sufficient inventory, which it defines as a cushion of \$36,000 plus 56% of the estimated current-month's sales (e.g., April's estimated sales are the basis for the inventory target at April 1). The Company pays half of its current-month purchases and leaves the other half to be paid in the following month. The inventory balance at the beginning of March was recorded as \$77,520.
- (9) The cost of goods sold amounts to 70% of sales.
- (10) Best Oxygen's sales are generated with 70% cash and 30% on accounts receivable. These accounts receivable are collected in the following month. There are no overdue accounts and Best Oxygen anticipates this situation to continue in the near future.
- (11) Best Oxygen's only available credit line is from founder Smith, who agreed to lend the Company money at 1.5 percent interest per month to cover any monthly shortage of cash for the next two years. On March 31, 2013, he put \$22,000 cash into the Company's checking account in exchange for his 100% equity position (not a loan) in Best Oxygen. An additional agreement with the founder stipulates a \$22,000 minimum cash balance at the beginning of each month in Best Oxygen's checking account. This means that the Company borrows from Smith (as needed) only at the end of the month, and subsequently also repays any loans at the end of the month, as conditions warrant. Interest is equal to 1.5% of the previous month's ending loan balance. No loan is outstanding as of March 31, 2013.
- (12) Best Oxygen will borrow \$29,835 from Smith in April, and then three repayments will be made, one in May of \$2,871, one in June of \$21,199, and one in July of \$5,765.
- (13) Gross property, plant and equipment on March 31 amounts to \$75,100.
- (14) Accumulated depreciation is recorded at \$29,440 on March 31.

## QUESTIONS

1. What do the monthly schedules of sales, inventory purchases and wages-and-commissions look like from April to July? (Hint: use March's numbers if needed.) In addition, construct a cash-budget table to explain the various items that affect monthly cash inflows and outflows under the current projection of business operations.
2. What do Best Oxygen's monthly income statements look like from March to July? In addition, aggregate the line items of these monthly statements and construct an income statement for the four-month period from April to July.
3. What do Best Oxygen's monthly balance sheets look like from March to July?
4. From April to July, what do Best Oxygen's monthly statements of cash flows look like?

5. Profit-making ability can be seen on income statements, while the changed composition of balance sheets over time can reveal how cash is used or where it is sourced from. Regarding the cash balance at the end of July, after examining the cash impacts from income statements and balance sheets, which of these two is the major factor that affects Best Oxygen's cash position in this four-month period?

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## TEACHING NOTES

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### CASE DESCRIPTION

*This case presents a teaching tool that equips students with an essential skill of short-term financial planning for entrepreneurs. Short-term financial planning concentrates on a venture's cash needs, the lifeblood of an entrepreneurial venture, so these ventures can better survive the early stages of operations. In this case, students are required to build up a cash budget by utilizing payment schedules of sales, inventory purchases and wage-and-commissions. Other tasks demanded by this challenging case include projecting the following: monthly income statements, balance sheets and statements of cash flows over a four-month period. Students who take on this case should possess a solid understanding of the interrelationship among income statements, balance sheets and statements of cash flows. This case is suitable for a graduate-level finance course or an upper-level undergraduate class of entrepreneurship in either finance or accounting departments. Students might be assigned to work individually or in groups on this case. Completion of the case requires 10-15 hours outside of class. Class discussion should be about 2-3 hours.*

### GENERAL COMMENTS

Cash is the lifeblood of an entrepreneurial venture. Without sufficient cash, a venture cannot stay alive. Short-term financial planning as introduced in this case concentrates on a venture's cash needs and involves constructing the schedules of sales, inventory purchases and wages-and-commissions in order to build up a cash budget. Monthly financial statements including income statements, balance sheets and statements of cash flows over a four-month period are also projected. Furthermore, it stipulates the major contributor for the cash position during this four-month period. This case provides training in essential skills that will better equip entrepreneurs to anticipate coming cash needs in order to survive the early stages of their ventures.

To accomplish this challenging task, small steps are arranged in an orderly fashion and presented in the following solutions. Forecasted sales are employed with an assumption regarding the composition of credit and cash sales for constructing monthly cash collections. Payment policies regarding inventory purchases and wages-and-commissions are guidelines for projecting cash outlays each month. Additional cash outflows given in this case include paying rent and purchasing insurance and a truck. Cash receipts, together with items related to cash disbursements, build up a cash budget. After interest expenses are derived from the cash budget, monthly income statements are further projected based on an assumption of the cost of goods sold and other provided information. To derive monthly balance sheets, relevant line items are established and various numbers for these line items on these sheets are taken from the previously derived schedules and tables. As the balance sheets are indeed balanced, the correctness of the cash budget, income statements and balance sheets is confirmed. Based on the figures from the income statements and balance sheets, monthly statements of cash flows are further derived. As the ending cash balances on these monthly statements of cash flow match those on cash budget and balance sheets, this challenging exercise of short-term financial projection is thus properly completed.

**QUESTIONS**

**QUESTION 1:** What do the monthly schedules of sales, inventory purchases and wages-and-commissions look like from April to July? (Hint: use March’s numbers if needed.) In addition, construct a cash-budget table to explain the various items that affect monthly cash inflows and outflows under the current projection of business operations.

**SOLUTION 1:** To understand the Company’s cash position, the major items related to receiving and spending cash first need to be identified. The collections from sales are the obvious major cash inflows. Although cash through financing (borrowing) is also a contributor, the setting of this case requires the case-solver(s) to project cash inflows from regular business operations prior to considering cash through financing. Regarding cash disbursements, buying inventories (capital) and paying wages and commissions (labor) are apparent items of cash outflows. In addition, there are cash outlays for (1) miscellaneous expenses, (2) rent and (3) buying a truck (the truck purchase belongs to the conventional accounting line item of Property, Plant and Equipment (PP&E)). Since the payment schedules for these three spending items are straightforward, they will be considered when constructing Best Oxygen’s cash budget.

Other impacts on cash flows are less simple due to an assumption made regarding the composition of sales and also because of the Company’s payment policy for inventories and wages-and-commissions. Therefore, building schedules for sales, inventory purchases and wages-and-commissions is beneficial in matching actual cash flows to appropriately corresponding months. The following lists required tasks in each step in order to accomplish a cash budget.

Step 1: Projecting Cash Inflows from Sales:

These are the sources of monthly cash inflows from sales: (a) cash received from the current-month sales and (b) accounts receivable (AR) from the previous month. Table 1 (below) details these projected cash inflows. By using the forecasted sales for the next four months and an assumption regarding the composition of sales (70% cash sales and 30% AR sales), we can project these two components of sales in each month (listed on Schedule 1 below). Adding the current-month cash sales to the collections of receivables from the previous month, cash inflows occurring in each month are thus projected. For example, April’s cash inflows, consisting of cash sales of \$73,500 that are equal to 70% of the sales forecasted for April ( $= 70\% * \$105,000 = \$73,500$ ) and the AR sales from March ( $= \$24,600 = 30\%$  of March’s Sales  $= 30\% * \$82,000$ ), are projected to be \$98,100. Following the same method of calculation, Schedule 2 shows that the cash received in May, June and July is estimated at \$153,300, \$141,800 and \$111,900, respectively.

Table 1: Projected Cash Inflows from Sales: Best Oxygen’s Sales Schedule

		March	April	May	June	July	August	April to July
<b>Schedule 1: Sales Forecast</b>		82,000	105,000	174,000	128,000	105,000	82,000	512,000
AR sales	30%	24,600	31,500	52,200	38,400	31,500		
Case sales	70%	57,400	73,500	121,800	89,600	73,500		
<b>Schedule 2: Cash Collections</b>								
Cash sales for this month			73,500	121,800	89,600	73,500		
100% of credit sales from last month (AR)		24,600	31,500	52,200	38,400			
Total collections			98,100	153,300	141,800	111,900		

*Note: This table lists schedules of sales compositions and cash collections from April to July. In addition, based on an assumption regarding the composition of sales (70% cash sales and 30% of AR sales each month), monthly cash collections on Schedule 2 are set to equal to the current-month cash sales plus the AR sales from previous month.*

Step 2: Projected Cash Outflows from Purchasing Inventory

Best Oxygen’s inventory policy states it will begin a month with sufficient inventory, defined as stocking a cushion of \$36,000 plus 56% of the that month’s projected sales. This policy will determine the beginning inventory balance each month. However, this is NOT the dollar amount of spending required to purchase inventory for the current month, as the Company pays half its monthly inventory purchases in the current month and half in the following month. To calculate each month’s inventory purchases, we first need to estimate what the target inventory level is for the end of that month. We then add the projected cost of goods sold (70% of sales) for the month to this ending target inventory in order to project the “Total Needed” inventory level. Deducting the month’s beginning inventory balance from the “Total Needed” will then result in the projected inventory purchases for the current month.

Accounting rules stipulate that the ending inventory balance in the current month be the same as the beginning inventory balance for the following month. Therefore, March’s ending balance is April’s beginning balance. For Best Oxygen, April’s beginning balance is based on the Company policy whereby the beginning balance is targeted to be equal to a \$36,000 cushion plus 56% of April’s sales. Table 2 (below) presents the Company’s scheduled inventory purchases and shows that this policy projects \$94,800 as April’s beginning target balance (\$36,000 plus 56% of April’s \$105,000 projected sales), which will be March’s ending balance as well. Following the process indicated in the previous paragraph, to this \$94,800 month-end target inventory we add March’s cost of goods sold (= 70% of \$82,000 (March sales) = \$57,400) to project March’s “Total Needed,” which is \$152,200. Deducting the beginning March balance of \$77,520, March’s inventory purchases are found to be \$74,680.

To project April’s inventory purchases, each step of the calculation illustrated here should again be followed. April’s beginning balance, however, is no longer “given” (as March’s was), but is based on March’s ending balance as calculated by the student(s): \$94,800. Recall that this calculation was the first step we took when projecting March’s inventory purchases. Table 2 below lists monthly inventory purchases from March to July based on this method of calculation.

Table 2: Best Oxygen’s Inventory Purchases Schedule

<b>Schedule 3: Purchases</b>		<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>April to July</b>
Ending target inventory = (1) + (2)		94,800	133,440	107,680	94,800	81,920	
(1) 56% of next-month sales	56%	58,800	97,440	71,680	58,800	45,920	
(2) Cushion	36,000	36,000	36,000	36,000	36,000	36,000	
Plus cost of goods sold (=70% of current-month sales)	70%	57,400	73,500	73,500	89,600	73,500	358,400
Total needed		152,200	206,940	229,480	184,400	155,420	
Minus beginning inventory		77,520	94,800	133,440	107,680	94,800	
Purchases		74,680	112,140	96,040	96,040	96,040	

*Note: This table projects the current-month inventory purchases from March through July. Ending target inventory is first estimated as the sum of 56% of the next-month sales and a desired cushion of \$36,000. Projected cost of goods sold, which is equal to 70% of the current-month sales, is then added to this ending target inventory. This addition will result in “Total needed” inventory. Deducting the current-month beginning inventory from this “Total needed” inventory will generate inventory purchases for each month from March to July.*

Payment for these inventory purchases are spread over two months. Only half of the current-month purchases is paid in the current month. The other half is left as accounts payable on the current-month books and paid off the next month. Table 3 (below) illustrates the effects of this purchasing policy on projected cash outflows and indicates that actual monthly cash outflows are the sum of 50% of this month’s purchases and 50% of the last month’s purchases (i.e., Inventory accounts payable from the previous month). For example, April’s disbursements for purchases are estimated to be a total of 50% of March’s purchases (= 50% \* \$74,680 = \$37,340) and 50% of April’s purchases (= 50% \* \$112,140 = \$56,070), which amounts to \$93,410 (= \$37,340 + \$56,070). Table 3 below projects monthly cash outflows from inventory purchases from April to July.

Table 3: Projected Cash Outflows from Purchasing Inventory

		March	April	May	June	July
<b>Schedule 4: Purchase Disbursements</b>						
50% of last month's purchases	50%		37,340	56,070	48,020	38,360
50% of this month's purchases	50%	37,340	56,070	48,020	38,360	30,310
Disbursements for purchases			93,410	104,090	86,380	68,670

*Note: This table projects monthly cash outflows from April to July, due to the disbursements from purchasing inventory. Best Oxygen's payment policy states that inventory purchases will be paid in two parts: half in the current month and the other half left to be paid in the following month. This means that in each month, there will be cash payments for 50% of last month's purchases and also for 50% of this month's purchases.*

### Step 3: Projected Cash Outflows from Paying the Expenses of Wages and Commissions

Table 4 (below) demonstrates the Company's cash outflows related to wages and commissions. Monthly wage expenses are estimated to be \$5,700 per month for the next four months. Adding an additional 15% of the current-month sales as commissions will provide the monthly wages-and-commissions expenses at Best Oxygen. Schedule 5 in Table 4 projects these expenses. For example, March sales were given as \$82,000. The wages-and-commissions expenses allocated to March are thus calculated as  $\$5,750 + (15\% * \$82,000) = \$18,050$ . Following the same method, these monthly expenses are projected to be \$21,500 in April, \$31,850 in May, \$24,950 in June and \$21,500 in July. Best Oxygen's wages-and-commissions payment policy (half is paid in the middle of the current month and the other half on the first day of the following month), however, causes cash outflow calculations to differ from simple wages-and-commissions calculations for each month. For example, on Schedule 6 of Table 4 shows that April's cash outflows under this policy are equal to \$19,775, which is the total of the second half of March's expenses ( $50\% * \$18,050 = \$9,025$ ), paid on April 1, plus the first half of April's expenses ( $50\% * \$21,500 = \$10,750$ ), paid in the middle of April. Note that this \$19,775 cash outflow is different from the projected wages-and-commissions expense for April of \$21,500 (see above). This same method of projection generates cash outflow estimates of \$26,675 for May, \$28,400 for June and \$23,225 for July.

Table 4: Best Oxygen's Projected Cash Outflows from Paying Wages-and-Commissions Expenses

		March	April	May	June	July	April to July
Projected sales		82,000	105,000	174,000	128,000	105,000	512,000
<b>Schedule 5: Wages and Commissions</b>							
Wages, all fixed		5,750	5,750	5,750	5,750	5,750	
Commissions (=15% of current-month sales)	15%	12,300	15,750	26,100	19,200	15,750	
Total expenses		18,050	21,500	31,850	24,950	21,500	99,800
<b>Schedule 6: Disbursements - Wages and Commissions</b>							
50% of last month's expenses	50%		9,025	10,750	15,925	14,475	
50% of this month's expenses	50%	9,025	10,750	15,925	12,475	10,750	
Total			19,775	26,675	28,400	23,225	

*Note: This table projects monthly wages-and-commissions expenses from April to July. Then based on Best Oxygen's payment policy, the cash outflows of this expense item are scheduled. Monthly wages is a fixed figure of \$5,750 while commissions are set at 15% of the projected sales each month. The payment policy for this expense item states that disbursements in the current month are equal to 50% of last month's expenses plus 50% of this month's expenses.*

### Step 4: Cash Budget

This is the final step to determine Best Oxygen's cash budget for the four coming months. Table 5 (below) illustrates this process by assembling previous projections to produce a Cash Budget. Generally speaking, in order to obtain the results in this cash-budget table, the estimates derived from Step 1 to Step 3, together with the additional cash outflows used to pay for rent, insurance and a truck, are all essential. Line items related to total cash receipts and disbursements are also constructed. Additionally, as Best Oxygen desires \$22,000 to be available in its checking account at the beginning of each month, the line item "Total Cash Needed" is projected. As total cash inflows do not always cover Total Cash Needed, additional financing from the founder with a monthly interest rate of 1.5% is accounted for (see April).

The repayment schedule (\$2871 in May, \$21,199 in June and \$5,765 in July) and the interest payments based on the loan balance at the start of each month will be taken into account to decide the “Total Effects of Financing.” Based on this case-setting, the end-of-period cash balance is thus equal to the sum of these three items: (1) \$22,000 (required minimum balance) in checking account; (2) “Excess of Total Cash” (= “Total Cash Balance before Cash Outflows and Financing” – “Total Cash Needed”); and (3) “Total Effects of Financing.”

To illustrate this cash-budget table further, Table 5 starts with \$22,000 as the beginning balance in April (this information is given in the case-setting). Adding collections from customers in April (\$98,100), the line item of “Total Cash Balance before Cash Outflows and Financing” arrives at \$120,100. Regarding cash disbursements, these line items are all relevant: (1) inventory purchases; (2) wages and commissions; (3) miscellaneous cash expenses (= 5% of current-month sales); (4) rent (\$3,600 per month); and (5) truck purchase (one-time occurrence of \$5,900 in April). Items (1) and (2) are the major cash outflows for most business operations. For Best Oxygen, these monthly cash outflows have already been scheduled on Tables 3 and 4. Items (3), (4) and (5) come from the background information given for this case. Considering all items from (1) to (5), total cash disbursements amount to \$127,935 in April.

Adding the minimum cash balance of \$22,000 to total cash disbursements of \$127,935, the line item of “Total Cash Needed” is \$149,935. Deducting this “Total Cash Needed” of \$149,935 from the “Total Cash Balance before Cash Outflows and Financing” of \$120,100, the line item of “Excess of Total Cash” is –\$29,835. This negative sign indicates a shortage of cash and a need for financing. (If the sign of “Excess of Total Cash” is positive, then there is no need for additional financing, which is projected to be the case in May, June and July.) Net borrowing of \$29,835 is projected to take place at the end of April, resulting in a cash inflow of that amount in “Total Effects of Financing.” The cash balance at the end of April is thus projected at \$22,000, which is the sum of the items mentioned in the previous paragraph: (1) \$22,000 (required minimum balance) in the checking account; (2) “Excess of Total Cash” (= “Total Cash Balance before Cash Outflows and Financing” – “Total Cash Needed”) of –\$29,835; and (3) “Total Effects of Financing” of \$29,835.

This end-of-period cash balance of \$22,000 in April will then become the beginning cash balance in May. Also, the \$29,835 borrowed from founder Smith at the end of April will be the beginning loan balance in May. Numbers for all line items of cash inflows and outflows in May are recorded following the same fashion described above for April. “Excess of Total Cash” in May is projected at \$10,235. The positive sign of this number indicates no need for additional borrowing. However, since there is a loan balance of \$29,835 that starts in May, repayment of \$2,871 and an interest payment of \$448 (= 1.5% of \$29,835) are scheduled to be paid.

These two items are cash outflows under “Total Effects of Financing” and are estimated to be –\$3,319. The end-of-period cash balance is again equal to the sum of the aforementioned three items: (1) \$22,000 (required minimum balance) in the checking account; (2) “Excess of Total Cash” of \$10,235 (= “Total Cash Balance before Cash Outflows and Financing” – “Total Cash Needed”); and (3) “Total Effects of Financing” of –\$3,319 (= –\$2,871 – \$448). The same calculation routine will then apply to June and July, with a June end-of-period cash balance of \$24,333 and a cash balance of \$29,637 by the end of July. This July balance is \$7,637 greater than the target ending cash balance of \$22,000. However, whether this increased cash balance is a result of profit-making by the regular business operation at Best Oxygen will need to be determined by examining the projected income statements in these four months.



Table 5: Best Oxygen's Cash Budget from April to July

	April	May	June	July
<b>1) Beginning Cash Balance</b>	22,000	22,000	28,916	24,333
Cash receipts:				
Collections from customers	98,100	153,300	141,800	111,900
<b>Total cash balance before cash outflows and financing</b>	120,100	175,300	170,716	136,233
Cash disbursements:				
Inventory purchases	93,410	104,090	86,380	68,670
Wages and commissions	19,775	26,675	28,400	23,225
Miscellaneous cash expenses (=5% of current-month sales)	5,250	8,700	6,400	5,250
Rent	3,600	3,600	3,600	3,600
Truck purchase	5,900	0	0	0
<b>Total cash disbursements</b>	127,935	143,065	124,780	100,745
Add: Minimum cash balance desired	22,000	22,000	22,000	22,000
<b>Total cash needed</b>	149,935	165,065	146,780	122,745
<b>2) Excess of Total Cash</b>				
= "Total cash balance before cash outflows and financing" minus "Total cash needed"	(29,835)	10,235	23,936	13,488
<b>Financing:</b>				
Net borrowing	29,835	0	0	0
Repayments	0	2,871	21,199	5,765
Loan balance	29,835	26,964	5,765	0
Interest (=1.5% per month* the beginning loan balance in current month)	0	448	404	86
<b>3) Total Effects of Financing</b>	29,835	(3,319)	(21,603)	(5,851)
<b>Cash Balance</b>				
= 1) Desired cash flow (\$22,000) + 2) excess of total cash + 3) total effects of financing	22,000	28,916	24,333	29,637

*Note: This table projects Best Oxygen's monthly cash positions from April to July. This table is constructed from top to bottom and then from left to right. Cash balance starts at \$22,000 in April. Then the major line items of "Total cash balance before cash outflows and financing" and "Total cash needed" are created. "Collections from customers" are based on Schedule 2. The numbers for "Inventory purchases" are taken from Schedule 4 and the "Wages and commissions" figures come from Schedule 6. Adding the minimum cash balance desired of \$22,000 to "Total cash disbursements" results in "Total cash needed." Deducting "Total cash needed" from "Total cash balance before cash outflows and financing" will yield "Excess of Total Cash." If this number turns out to be negative, this amount will need to be financed; otherwise, there is no need for borrowing. "Total Effects of Financing" is equal to "Net borrowing" minus the sum of "Repayments" and "Interest." The cash balance in the end of each month is set to be the sum of 1) desired cash flows (\$22,000) + 2) excess of total cash + 3) total effects of financing.*

**QUESTION 2:** What do Best Oxygen's monthly income statements look like from March to July? In addition, aggregate the line items of these monthly statements and construct an income statement for the four-month period from April to July.

**SOLUTION 2:** Having monthly interest expenses derived from the cash-budget table, constructing income statements for these four months becomes feasible. Table 6 (below) demonstrates these monthly income statements. While the conventional line items of an income statement stay unchanged, operating expenses in this case include (1) wages and commissions, (2) rent, (3) miscellaneous cash expenses, (4) insurance and (5) depreciation. In addition, since this case assumes no tax (due to the fact that at the early stage of most entrepreneurial ventures, companies generally do not expect to make enough profits to exceed the zero-percent tax bracket, and even they do, the amount of tax owed is small enough to ignore at this point), pretax income is the same as net income.

Wages-and-commissions expenses are projected and taken from Schedule 5. Rent is a fixed amount of \$3,600 per month. Miscellaneous cash expenses each month are set as 5% of projected sales and appear already on the cash budget. Insurance is expensed at \$400 per month and depreciation is estimated to be \$1,050 per month. Interest expenses figures have already been projected and are taken from the cash-budget table. Table 6 below projects the monthly income statements. The income statement for the four-month period is also listed after July.

Table 6: Best Oxygen's Projected Income Statements

	March	April	May	June	July	April to July
Sales	82,000	105,000	174,000	128,000	105,000	512,000
Cost of goods sold (=70% of current-month sales)	57,400	73,500	121,800	89,600	73,500	358,400
Gross profit	24,600	31,500	52,200	38,400	31,500	153,600
Operating expenses:						
Wage and commissions	18,050	21,500	31,850	24,950	21,500	99,800
Rent	3,600	3,600	3,600	3,600	3,600	14,400
Miscellaneous cash expenses (=5% of current-month sales)	4,100	5,250	8,700	6,400	5,250	25,600
Insurance	400	400	400	400	400	1,600
Depreciation	1,050	1,050	1,050	1,050	1,050	4,200
Total operating expenses	2,720	31,800	45,600	36,400	31,800	145,600
Income from operation	(2,600)	(300)	6,600	2,000	(300)	8,000
Interest expense	0	0	448	404	86	938
Net income	(2,600)	(300)	6,152	1,596	(386)	7,062

*Note: This table projects monthly income statements from March to July. While the conventional line items of an income statement stay unchanged, operating expenses in this case include (1) wages and commissions, (2) rent, (3) miscellaneous cash expenses, (4) insurance and (5) depreciation. Wages-and-commissions expenses are projected and taken from Schedule 5. Rent is a fixed amount of \$3,600 per month. Miscellaneous cash expenses each month are set to be 5% of projected sales and appeared already on Table 5 of the cash budget. Insurance is expensed at \$400 per month and depreciation is estimated to be \$1,050 per month. Interest-expense figures have already been projected and are taken from the cash-budget table. Assuming no expense for tax, pretax income is then equal to net income.*

From Table 6 (above), it is easy to see that Best Oxygen operates at a loss in the first two months. However, net income in May turns positive due to its large sales and is projected at \$6,152, the highest number in these four months. The net income in June is projected to be a positive figure of \$1,596, but is a much lower number than the one seen in May. The July profit turns to be a negative figure of -\$386. Overall, these projected profits demonstrate a positive correlation with forecasted sales. To conclude, for this four-month period, Best Oxygen is projected to make a total profit of \$7,062. With an increase of cash balance amounts to \$7,637 in these four months, the main contributor of this cash increase is evidently due to these positive flows of net income. These profits are projected to contribute 92% ( $=\$7,062/\$7,637$ ) of the cash increase during this four-month period.

**QUESTION 3:** What do Best Oxygen's monthly balance sheets look like from March to July?

**SOLUTION 3:** Based on the information given in this case, line items included under current assets are (1) cash, (2) accounts receivable, (3) merchandise inventory and (4) prepaid insurance. Line items of gross fixed assets and accumulated depreciation are listed below total current assets and their numerical values on March 31, 2013, are given in this case: Gross property, plant and equipment (listed as "Gross fixed assets" in table below) is \$75,100 and accumulated depreciation amounts to \$29,440. Current liabilities contain (1) accounts payable, (2) accrued wages-and-commissions payable, (3) loan (from founder). There is no long-term debt in this case. Adding owner's equity to total current liabilities will then equal "Total liabilities and equity." Table 7 (below) lists these monthly balance sheets from March to July.

Per the case-setting, the cash balance on the March 31 balance sheet is \$22,000. This amount is further confirmed by the case-setting regarding the founder of Best Oxygen putting this amount in the company's checking account on March 31 in exchange for receiving an equity position. For the rest of the months from April to July, numbers from the ending cash balances on the last line of the cash budget are used for the "Cash" line item on the monthly balance sheets. AR numbers are obtained from the "AR Sales" line item on Schedule 1 and the figures for merchandise inventory are taken from the "Ending target inventory" on Schedule 3. Insurance costs \$400 per month. Best Oxygen has, however, prepaid a one-year premium on March 31, 2013. So on March 31, 2013, the Company has a current asset of prepaid insurance that is valued at the 12-month premium of \$4,800 ( $=12*\$400$ ). This implies that on April 30 this asset of prepaid insurance will have been consumed for one month and will thus be worth \$400 less,

becoming \$4,400 (=11\*\$400). This \$400 reduction will continue to apply to May, June and July. Based on this calculation, \$4,000 is projected for May, \$3,600 for June and \$3,200 for July.

Table 7: Best Oxygen's Projected Balance Sheets

	March	April	May	June	July
Current assets:					
Cash	22,000	22,000	28,916	24,333	29,637
Accounts receivable	24,600	31,500	52,200	38,400	31,500
Merchandise inventory	94,800	133,440	107,680	94,800	81,920
Prepaid insurance	4,800	4,400	4,000	3,600	3,200
Total current assets	146,200	191,340	192,796	161,133	146,257
Gross fixed assets	75,100	81,000	81,000	81,000	81,000
Accumulated depreciation (\$1,050 per month)	29,440	30,490	31,540	32,590	33,640
Net fixed assets	45,660	50,510	49,460	48,410	47,360
Total assets	191,860	241,850	242,256	209,543	193,617
Current liabilities					
Accounts payable	37,340	56,070	48,020	38,360	30,310
Accrued wages and commissions payable	9,025	10,750	15,925	12,475	10,750
Loan	0	29,835	26,964	5,765	0
Total current liabilities	46,365	96,655	90,909	56,600	41,060
Owner's equity	145,495	145,195	151,347	152,943	152,557
Total liabilities and equity	191,860	241,850	242,256	209,543	193,617

*Note: This table projects monthly balance sheets from March to July. Cash in March is given from this case-setting and the numbers for the rest of the months come from the last line of the cash budget. AR numbers are obtained from the line item "AR sales" from Schedule 1. The figures of merchandise inventory are taken from the "Ending target inventory" on Schedule 3. Prepaid insurance has a 12-month value in March. It is reduced by \$400 per month. Gross fixed assets in March are given by this case-setting. With a purchase of a truck in April, this line item is increased by the purchase amount of \$5,900 and stays unchanged thereafter for May, June and July. Accumulated depreciation is increased by \$1,050 per month. Taking numbers from the last line item of "Purchases" on Schedule 3 and dividing these numbers by 2, these numbers*

Regarding gross fixed assets, the March number is given at \$75,100. On April 1, Best Oxygen purchases a truck for \$5,900 and there is no more capital spending recorded for this line item in the other months. This means that gross fixed assets in April will be increased by this additional \$5,900 purchase and become \$81,000. This number will then stay unchanged thereafter for May, June and July.

Depreciation is estimated to be \$1,050 per month. This includes the depreciation applied to the purchased truck. This information indicates the accumulated-depreciation line item will be increased by \$1,050 per month. Therefore, accumulated depreciation is projected to be \$30,490 in April, \$31,540 in May, \$32,590 in June and \$33,640 in July.

Regarding accounts payable, since Best Oxygen only pays half of its current-month purchases and leaves the other half as accounts payable for the current month, we will simply divide the last line item of "Purchases" on Schedule 3 by 2, thus accounting for the AP line item from March to July. The wages-and-commissions payment policy at Best Oxygen follows the same payment schedule as inventory purchases. For each month, it pays half of its current-month expenses and leaves the rest as "accrued wages-and-commissions payable." Therefore, to project this line item, we again take numbers from the "Total expenses" line item from March to July on Schedule 5 and divided them by 2. These wages-and-commissions payable are projected to be \$9,025 in March, \$10,750 in April, \$15,925 in May, \$12,475 in June and \$10,750 in July.

The loan balance at the end of March is zero, as given in the case-setting. The numbers for other months are taken from the "Loan balance" line item on the cash-budget table. At this point, the major aggregated lines of balance sheets – total current assets, total assets, total current liabilities, and total liabilities and equity – can be calculated. Special attention should be paid to March. March's owner's equity will need to be derived by using "total asset = total liability ("total current liabilities" in this case, since Best Oxygen does not have long-term debt) + owner's equity." March's total current liabilities of \$46,365

plus owner's equity (unknown at this point) equal the total assets of \$191,860. Owner's equity is then derived at \$145,495 ( $= \$191,860 - \$46,365$ ). The calculation of owner's equity for other months, however, will follow the basic accounting rule and be equal to the owner's equity of the previous month plus the current month's net income. (As there is no dividend payout, net income is the same as Addition to Retained Earnings.) Taking April as an example, after adding April's net income ( $= -\$300$ ) to March's owner's equity (\$145,495), April's owner's equity is then projected at \$145,195 ( $= \$145,495 - \$300$ ). Adding this equity (\$145,195) to the "total current liabilities" (\$96,655) then results in "total liabilities and equity" of \$241,850 ( $= \$145,195 + \$96,655$ ). Estimates of owner's equity for the other months are obtained by following this rule. Adding owner's equity to total current liabilities results in the same numerical values as total assets each month, indicating that these balance sheets pass an insanity check: "Total Assets = Total Liabilities plus Owner's Equity." Thus, the financial statements derived up to this point are constructed correctly.

**QUESTION 4:** From April to July, what do Best Oxygen's monthly statements of cash flows look like?

**SOLUTION 4:** With correctly constructed income statements and balance sheets, projecting statements of cash flows becomes an easy task. Table 8 (below) lists these statements of cash flows from April to July. Cash inflows or outflows for a business come from three major activities: (1) operating activities; (2) long-term investing; and (3) financing activities. For operating activities, the main item (or contributor) for cash flows will hopefully be net income. As depreciation expense on income statements is a non-cash expense, this expense should be added back to net income to reflect the economic reality of a business in terms of its ability to generate cash. Furthermore, building "cash-free" current assets or leveraging from "debt-free" current liabilities will affect each current-month's cash position. For example, spending cash in building inventory requires cash outlays in the current month, while delaying payments until the following month, i.e., increasing payables accruals, will increase the current cash position. These effects will also need to be considered when deriving "Net Cash Flow from Operating Activities." Furthermore, since numbers on balance sheets are the end-of-period balances, in order to generate the flow measures from these balance sheets so they can be used in statements of cash flows (or be comparable to the figures on income statements), the first difference in numerical values from current to previous month will be adopted. For example, a line item of "An Increase in AR" in April is equal to (April AR - March AR). The calculated number of "An Increase in AR" could be either positive or negative, but it should always use the current month's figure minus the previous month's number. For example, "An Increase in AR" in April ( $= \$6,900 = \$31,500 - \$24,600$ ) is equal to April's AR (\$31,500) minus March's AR (\$24,600).

For Best Oxygen, these line items are the components of the "cash-free and debt-free" working capital: (1) increase in AR; (2) increase in inventory; (3) increase in prepaid insurance; (4) increase in AP; and (5) increase in accrued liabilities. The size of this working capital will affect cash flows in addition to the effects of net income and depreciation expense. Items (1) to (3) are with a negative sign as an increase in building these current assets will result in cash outflows and a decrease in these assets (divesting or selling) will increase cash inflows. Items (4) and (5) have a positive sign as an increase in AP or accrued liabilities implies payment obligations are postponed to the next month, which results in a higher cash balance in the current month. Conversely, a decrease of AP or accrued liabilities indicates that payment obligations are lighter as they have been paid out in the current month.

Regarding Table 8 above, estimates of net income and depreciation expense come from the monthly income statements on Table 6. Numbers for line items (1) to (5), which relate to the "cash-free and debt-free" working capital, are taken from the monthly balance sheets on Table 7 and are constructed in the difference form. The "Net Cash Flow from Operating Activities" line item indicates that operation activities in April fail to contribute positively to the Company's cash position, but those occurring in May, June and July do have positive impacts on Best Oxygen's cash inflows.

Table 8: Best Oxygen's projected Statements of Cash Flows from April to July

	April	May	June	July
<b>1) Operating activities:</b>				
Net income	(300)	6,152	1,596	(386)
+ Depreciation expense	1,050	1,050	1,050	1,050
– Increase in accounts receivables	6,900	20,700	(13,800)	(6,900)
– Increase in inventory	38,640	(25,760)	(12,880)	(12,880)
– Increase in prepaid insurance	(400)	(400)	(400)	(400)
+ Increase in accounts payable	18,730	(8,050)	(9,660)	(8,050)
+ Increase in accrued liabilities	1,725	5,175	(3,450)	(1,725)
<b>Net cash flow from operating activities</b>	<b>(23,935)</b>	<b>9,787</b>	<b>16,616</b>	<b>11,069</b>
<b>2) Long-term investing activities:</b>				
Capital expenditures (= an increase in gross fixed assets) (= an increase in net fixed assets + current-month depreciation expense)	5,900	0	0	0
<b>Net cash flow from long-term investing activities</b>	<b>(5,900)</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>3) Financing activities:</b>				
+ Increase in equity	0	0	0	0
– Dividends	0	0	0	0
+ Increase in debt	29,835	(2,871)	(21,199)	(5,765)
<b>Net cash flow from financing activities</b>	<b>29,835</b>	<b>(2,871)</b>	<b>(21,199)</b>	<b>(5,765)</b>
Summary:				
<b>Net change in cash</b>	<b>0</b>	<b>6,916</b>	<b>(4,583)</b>	<b>5,304</b>
Beginning cash balance	22,000	22,000	28,916	24,333
Ending cash balance	22,000	28,916	24,333	29,637

*Note: Following a standard format for constructing statements of cash flows, the above table projects monthly statements of cash flows for Best Oxygen from April to July. The numbers for net income, depreciation expense and dividend (zero in this case) are taken from monthly income statements on Table 6 and the rest of the figures on this table come from the monthly balance sheets on Table 7. For the summary panel on the bottom of this table, net change in cash is calculated as the sum of (1) net cash flow from operating activities, (2) net cash flow from long-term investing activities and (3) net cash flow from financing activities. Beginning cash balance in April is given as \$22,000 per the case-setting.*

The second type of business activities that impact cash are “long-term investing” activities. These activities refer to spending funds in buying long-term assets or receiving funds by disinvesting (selling) long-term assets. In this case, capital expenditure is defined as “an increase of gross fixed assets” and refers to the \$5,900 Best Oxygen spent in buying a truck. Capital expenditure could also be calculated as “increase of net fixed assets” plus “current-month depreciation expense.” For example, in April this “increase of net fixed assets” is \$4,850 (= \$50,510 of net fixed assets in April – \$45,660 of net fixed assets in March). Adding this \$4,850 to \$1,050, April's depreciation expense, will also result in \$5,900. This spending is the only long-term investing in these four months for Best Oxygen and the line item of “Net Cash Flow from Long-term Investing Activities” comes with a negative sign as it is obviously a cash outflow.

A company's financing activities will impact its cash position. For example, a company could strengthen its cash position by issuing additional equity or selling partial ownership to an interested investor or raising new debt. Conversely, buying back its own stock and retiring existing debt will weaken its cash position. In addition, dividend payout, a flow measure that appears on income statements, is obviously a cash outflow and, according to GAAP, it is a line item that belongs to the financing activities on the statement of cash flows. In addition, since interest expense is deducted on the income statement when net income is generated and it later becomes the first line item appearing on the statement of cash flows, this expense, although related to financing activities, should not be listed as one in order to avoid double-counting.

In this case, there is no new equity issued or dividend payout made in these four months. The only fund-raising activity Best Oxygen engages in is its borrowing of \$29,835 from its founder in April to cover its “Total Cash Needed” (see cash budget on Table 5). This is the only cash inflow recorded regarding financing activity during this four-month period. A positive number of \$29,835 is thus projected for the

“Increase in debt” line item for April. Three repayments of this loan, \$2,871 in May, \$21,199 in June and \$5,765 in July, are obviously cash outflows and recorded with a negative sign for this line item in these months.

The sum of net cash flows from operating, long-term investing and financing activities will yield the “Net Change in Cash” line item on this financial statement. For Best Oxygen, it is at zero in April, \$6,916 in May, -\$4,583 in June and \$5,304 in July. Adding “Net Change in Cash” to “Beginning Cash Balance” will generate “Ending Cash Balance.” For example, in April, zero is added to “Beginning Cash Balance” of \$22,000 (taken from the “Cash” line item in March’s balance sheet), which amounts to \$22,000 for the “Ending Cash Balance” in April. This April “Ending Cash Balance” will later become the “Beginning Cash Balance” in May. Adding “Net Change in Cash” in May to May’s “Beginning Cash Balance” will result in May’s “Ending Cash Balance” (\$28,916). Continuing these calculations, the ending cash balances in June (\$24,333) and July (\$29,637) are found. As these ending cash balances match the numbers from the “Cash” line item on the income statements and the “Cash balance” line item on the cash-budget table, the correctness of these monthly statements of cash flows is confirmed.

**QUESTION 5:** Profit-making ability can be seen on income statements, while the changed composition of balance sheets over time can reveal how cash is used or where it is sourced from. Regarding the cash balance at the end of July, after examining the cash impacts from income statements and balance sheets, which of these two is the major factor that affects Best Oxygen’s cash position in this four-month period?

**SOLUTION 5:** Table 9 (below) presents the cash impacts from income statements and balance sheets over this four-month period. Cash is projected to increase by \$7,637 for this period. The cash impact from the income statements from March to July amounts to \$7,062 (Net income – Dividends), which contributes 92% of the overall cash increase. This leaves an 8% contribution from the changes made on balance sheets during this period. Thus, the major contributor to Best Oxygen’s cash position is the net income generated in this four-month period, which is a positive sign for Best Oxygen at this early stage of operations.

Table 9: Composition of Cash Impacts

	Increase	%
<b>Cash balance:</b>		
Cash impact from income statements over this four-month period (Net income – dividends)	7,637	100%
Cash impact from balance sheets over this four-month period (Use/source of cash)	7,062	92%
	575	8%

*Note: This table presents the cash impacts from income statements and balance sheets over this four-month period. Cash is projected to increase by \$7,637 for this period. The cash impact from income statements from March to July amounts to \$7,062 (Net income – Dividends), which contributes 92% of this cash increase. This leaves an 8% contribution from changes made on the balance sheets during this period.*

## BIOGRAPHY

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