

# ANSWER KEY

## Homework 1 ADM 3350 A&B F2013

Prof. K. Lajili

Total 100 points

### CH. 27

27 points total

#### Problem 27.1 Cash Equation

6 points total

McConnell Corp. has a book net worth of \$12,100. Long-term debt is \$2,450. Net working capital, other than cash, is \$3,200. Fixed assets are \$3,000.

a. How much cash does the company have?

3 points

Cash \$ 7,550 ± 0.1%

b. If current liabilities are \$1,650, what are current assets? 3 points

Current assets \$ 12,400 ± 0.1%

#### Explanation:

a.

The total liabilities and equity of the company are the net book worth, or market value of equity, plus current liabilities and long-term debt, so:

$$\text{Total liabilities and equity} = \$12,100 + 1,650$$

$$\text{Total liabilities and equity} = \$13,750$$

This is also equal to the total assets of the company. Since total assets are the sum of all assets, and cash is an asset, the cash account must be equal to total assets minus all other assets, so:

$$\text{Cash} = \$13,750 - 3,000 - 3,200$$

$$\text{Cash} = \$7,550$$

b.

We have NWC other than cash, so the total NWC is:

$$\text{NWC} = \$7,550 + 3,200$$

$$\text{NWC} = \$10,750$$

We can find total current assets by using the NWC equation. NWC is equal to:

$$\text{NWC} = \text{CA} - \text{CL}$$

$$\$10,750 = \text{CA} - \$1,650$$

$$\text{CA} = \$12,400$$

Problem 27.2 Calculating Cash Collections

9 points total

The Litzenberger Company has projected the following quarterly sales amounts for the coming year:

	Q1	Q2	Q3	Q4
Sales	\$610	\$580	\$710	\$660

- a. Accounts receivable at the beginning of the year are \$250. Litzenberger has a 45-day collection period. Calculate cash collections in each of the four quarters by completing the following: **3 points**

	Q1	Q2	Q3	Q4
Beginning receivables	\$ 250.00 ± 1%	\$ 305.00 ± 1%	\$ 290.00 ± 1%	\$ 355.00 ± 1%
Sales	610.00	580.00	710.00	660.00
Cash collections	555.00 ± 1%	595.00 ± 1%	645.00 ± 1%	685.00 ± 1%
Ending receivables	\$ 305.00 ± 1%	\$ 290.00 ± 1%	\$ 355.00 ± 1%	\$ 330.00 ± 1%

- b. Accounts receivable at the beginning of the year are \$250. Litzenberger has a 60-day collection period. Calculate cash collections in each of the four quarters by completing the following: **3 points**

	Q1	Q2	Q3	Q4
Beginning receivables	\$ 250.00 ± 1%	\$ 406.67 ± 1%	\$ 386.67 ± 1%	\$ 473.33 ± 1%
Sales	610.00	580.00	710.00	660.00
Cash collections	453.33 ± 1%	600.00 ± 1%	623.33 ± 1%	693.33 ± 1%
Ending receivables	\$ 406.67 ± 1%	\$ 386.67 ± 1%	\$ 473.33 ± 1%	\$ 440.00 ± 1%

- c. Accounts receivable at the beginning of the year are \$250. Litzenberger has a 30-day collection period. Calculate cash collections in each of the four quarters by completing the following: **3 points**

	Q1	Q2	Q3	Q4
Beginning receivables	\$ 250.00 ± 1%	\$ 203.33 ± 1%	\$ 193.33 ± 1%	\$ 236.67 ± 1%
Sales	610.00	580.00	710.00	660.00
Cash collections	656.67 ± 1%	590.00 ± 1%	666.67 ± 1%	676.67 ± 1%
Ending receivables	\$ 203.33 ± 1%	\$ 193.33 ± 1%	\$ 236.67 ± 1%	\$ 220.00 ± 1%

***Explanation:***

***a.***

A 45-days collection period implies all receivables outstanding from the previous quarter are collected in the current quarter, and:

$(90-45)/90 = 1/2$  of current sales are collected.

***b.***

A 60-days collection period implies all receivables outstanding from the previous quarter are collected in the current quarter, and:

$(90-60)/90 = 1/3$  of current sales are collected.

***c.***

A 30-days collection period implies all receivables outstanding from the previous quarter are collected in the current quarter, and:

$(90-30)/90 = 2/3$  of current sales are collected.

Problem 27.3 Calculating Cycles

**7 points total**

Consider the following financial statement information for the Bulldog Icers Corp.:

Item	Beginning	Ending
Inventory	\$ 18,322	\$ 20,179
Accounts receivable	19,657	22,918
Accounts payable	16,480	18,452
Net sales	\$ 247,125	
Cost of goods sold	141,997	

Calculate the operating and cash cycles. **3.5 points (operating cycle calculation) + 3.5 points (cash cycle calculation)**

Operating cycle	80.9242 ± 1% days
Cash cycle	36.0283 ± 1% days

**Explanation:**

The operating cycle is the inventory period plus the receivables period. The inventory turnover and inventory period are:

$$\begin{aligned} \text{Inventory turnover} &= \text{COGS}/\text{Average inventory} \\ \text{Inventory turnover} &= \$141,997 / \{[\$18,322 + 20,179]/2\} \\ \text{Inventory turnover} &= 7.3763 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{Inventory period} &= 365 \text{ days}/\text{Inventory turnover} \\ \text{Inventory period} &= 365 \text{ days}/7.3763 \\ \text{Inventory period} &= 49.4828 \text{ days} \end{aligned}$$

And the receivables turnover and receivables period are:

$$\begin{aligned} \text{Receivables turnover} &= \text{Credit sales}/\text{Average receivables} \\ \text{Receivables turnover} &= \$247,125 / \{[\$19,657 + 22,918]/2\} \\ \text{Receivables turnover} &= 11.6089 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{Receivables period} &= 365 \text{ days}/\text{Receivables turnover} \\ \text{Receivables period} &= 365 \text{ days}/11.6089 \\ \text{Receivables period} &= 31.4414 \text{ days} \end{aligned}$$

So, the operating cycle is:

$$\begin{aligned} \text{Operating cycle} &= 49.4828 \text{ days} + 31.4414 \text{ days} \\ \text{Operating cycle} &= 80.9242 \text{ days} \end{aligned}$$

The cash cycle is the operating cycle minus the payables period. The payables turnover and payables period are:

$$\text{Payables turnover} = \text{COGS}/\text{Average payables}$$

Payables turnover =  $\$141,997 / \{[\$16,480 + 18,452]/2\}$   
Payables turnover = 8.1299 times

Payables period = 365 days/Payables turnover  
Payables period = 365 days/8.1299  
Payables period = 44.8959 days

So, the cash cycle is:

Cash cycle = 80.9242 days – 44.8959 days  
Cash cycle = 36.0283 days

The firm is receiving cash on average 36.0283 days after it pays its bills.

Problem 27.4 Calculating Payments

5 points total

The Thakor Corp.'s purchases from suppliers in a quarter are equal to 65 percent of the next quarter's forecast sales. The payables period is 60 days. Wages, taxes, and other expenses are 20 percent of sales, and interest and dividends are \$60 per quarter. No capital expenditures are planned.

Here are the projected quarterly sales:

	Q1	Q2	Q3	Q4
Sales	\$670	\$820	\$790	\$700

Sales for the first quarter of the following year are projected at \$860. Calculate the company's cash outlays by completing the following: **5 points**

	Q1	Q2	Q3	Q4
Payment of accounts	\$ 468.00 ± 1%	\$ 526.50 ± 1%	\$ 494.00 ± 1%	\$ 489.67 ± 1%
Wages, taxes, and other expenses	134.00 ± 1%	164.00 ± 1%	158.00 ± 1%	140.00 ± 1%
Long-term financing expenses (interest and dividends)	60.00 ± 1%	60.00 ± 1%	60.00 ± 1%	60.00 ± 1%
<b>Total</b>	<b>\$ 662.00 ± 1%</b>	<b>\$ 750.50 ± 1%</b>	<b>\$ 712.00 ± 1%</b>	<b>\$ 689.67 ± 1%</b>

**Explanation:**

Since the payables period is 60 days, the payables in each period will be:

Payables each period = 2/3 of last quarter's orders + 1/3 of this quarter's orders

Payables each period = 2/3(0.65) times current sales + 1/3(0.65) next period sales

## CH. 29

## 35 points total

### Problem 29.1 Cash Discounts

### 7 points total

You place an order for 200 units of inventory at a unit price of \$105. The supplier offers terms of 3/10, net 25.

**a-1.** How long do you have before the account is overdue? **1 point**

Number of days

**a-2.** If you take the full period, how much should you remit? **1 point**

Remittance \$

**b-1.** What is the discount being offered? **1 point**

Discount rate  %

**b-2.** How quickly must you pay to get the discount? **1 point**

Number of days

**b-3.** If you do take the discount, how much should you remit? **1 point**

Remittance \$

**c-1.** If you don't take the discount, how much interest are you paying implicitly? **1 point**

Implicit interest \$

**c-2.** How many days' credit are you receiving in excess of the discount period? **1 point**

Number of days

### **Explanation:**

**a.**

There are 25 days until account is overdue. If you take the full period, you must remit:

$$\text{Remittance} = 200(\$105)$$

$$\text{Remittance} = \$21,000$$

**b.**

There is a 3 percent discount offered, with a 10 day discount period. If you take the discount, you will only have to remit:

$$\text{Remittance} = (1 - 0.03)(\$21,000)$$

$$\text{Remittance} = \$20,370$$

**c.**

The implicit interest is the difference between the two remittance amounts, or:

$$\text{Implicit interest} = \$21,000 - 20,370$$

Implicit interest = \$630

The number of days' credit offered is:

Days' credit = 25 – 10

Days' credit = 15 days

Problem 29.2 ACP and Accounts Receivable

5 points total

Kyoto Joe Inc. sells earnings forecasts for Japanese securities. Its credit terms are 3/15, net 30. Based on experience, 68 percent of all customers will take the discount.

- a. What is the average collection period for Kyoto Joe? **3 points**

Average collection period  days

- b. If Kyoto Joe sells 1,760 forecasts every month at a price of \$1,500 each, what is its average balance sheet amount in accounts receivable? **2 points**

Average Accounts Receivable \$

**Explanation:**

a.

The average collection period is the percentage of accounts taking the discount times the discount period, plus the percentage of accounts not taking the discount times the days' until full payment is required, so:

$$\text{Average collection period} = 0.68(15 \text{ days}) + 0.32(30 \text{ days})$$

$$\text{Average collection period} = 19.8 \text{ days}$$

b.

And the average daily balance is:

$$\text{Average balance} = 1,760(\$1,500)(12)(19.8/365)$$

$$\text{Average balance} = \$1,718,531.51$$

Problem 29.3 ACP and Receivables Turnover

**5 points total**

Lipman Inc. has an average collection period of 43 days. Its average daily investment in receivables is \$41,000.

a. What is the receivables turnover? **3 points**

Receivables turnover  times

b. What are annual credit sales? **2 points**

Annual credit sales \$

***Explanation:***

The receivables turnover is:

Receivables turnover =  $365 / \text{Average collection period}$

Receivables turnover =  $365 / 43$

Receivables turnover = 8.4884 times

And the annual credit sales are:

Annual credit sales = Receivables turnover  $\times$  Average daily receivables

Annual credit sales =  $8.4884(\$41,000)$

Annual credit sales = \$348,023.26

Problem 29.4 Evaluating Credit Policy

7 points total

Air Spares is a wholesaler that stocks engine components and test equipment for the commercial aircraft industry. A new customer has placed an order for eight high-bypass turbine engines, which increase fuel economy. The variable cost is \$1.5 million per unit, and the sales price is \$2 million each. Credit is extended for one period, and based on historical experience, payment for about 1 out of every 240 such orders is never collected. The required return is 2.7 percent per period.

a-1. Assuming that this is a one-time order, what is the NPV per unit? **2 points**

Net present value \$  per unit

a-2. Should the order be filled?

Yes

No

b. What is the break-even probability of default for a one-time order? **1.5 points**

Break-even probability of default  %

c-1. Suppose that customers who don't default become repeat customers and place the same order every period forever. Further assume that repeat customers never default. What is the NPV per unit? **2 points**

Net present value \$  per unit

c-2. Should the order be filled if the customer will become a repeat customer?

Yes

No

c-3. What is the break-even probability of default assuming that the customer will become a repeat customer? **1.5 points**

Break-even probability of default  %

**Explanation:**

a. The cash outlay for the credit decision is the variable cost of the engine. If this is a one-time order, the cash inflow is the present value of the sales price of the engine times one minus the default probability. So, the NPV per unit is:

$$\text{NPV} = -\$1,500,000 + (1 - 0.004167)(\$2,000,000)/1.027$$

$$\text{NPV} = \$439,305.42 \text{ per unit}$$

The company should fill the order.

b.

To find the breakeven probability of default,  $\pi$ , we simply use the NPV equation from part a, set it equal to zero, and solve for  $\pi$ . Doing so, we get:

$$\text{NPV} = 0 = -\$1,500,000 + (1 - \pi)(\$2,000,000)/1.027$$
$$\pi = 0.2298 \text{ or } 22.98\%$$

We would not accept the order if the default probability was higher than 22.98 percent.

c.

If the customer will become a repeat customer, the cash inflow changes. The cash inflow is now one minus the default probability, times the sales price minus the variable cost. We need to use the sales price minus the variable cost since we will have to build another engine for the customer in one period. Additionally, this cash inflow is now a perpetuity, so the NPV under these assumptions is:

$$\text{NPV} = -\$1,500,000 + (1 - 0.004167)(\$2,000,000 - 1,500,000)/0.027$$
$$\text{NPV} = \$16,941,358.02 \text{ per unit}$$

The company should fill the order.

$$\text{NPV} = 0 = -\$1,500,000 + (1 - \pi)(\$2,000,000 - 1,500,000)/0.027$$
$$\pi = 0.919 \text{ or } 91.90\%$$

Problem 29.5 Credit Policy Evaluation

**7 points total**

The Harrington Corp. is considering a change in its cash-only policy. The new terms would be net one period. The required return is 2 percent per period. Consider the following additional information.

	Current Policy	New Policy
Price per unit	\$ 75	\$ 81
Cost per unit	\$ 37	\$ 37
Unit sales per month	3,400	3,460

a. Calculate the NPV of the decision to change credit policies. **6 points**

Net present value \$ 894,780.00 ± 0.1%

b. Should Harrington proceed or not? **1 point**

Yes

No

**Explanation:**

The cash flow from either policy is:

$$\text{Cash flow} = (P - v)Q$$

So, the cash flows from the old policy are:

$$\text{Cash flow from old policy} = (\$75 - 37)(3,400)$$

$$\text{Cash flow from old policy} = \$129,200$$

And the cash flow from the new policy would be:

$$\text{Cash flow from new policy} = (\$81 - 37)(3,460)$$

$$\text{Cash flow from new policy} = \$152,240$$

So, the incremental cash flow would be:

$$\text{Incremental cash flow} = \$152,240 - 129,200$$

$$\text{Incremental cash flow} = \$23,040$$

The incremental cash flow is a perpetuity. The cost of initiating the new policy is:

$$\text{Cost of new policy} = [PQ + v(Q' - Q)]$$

So, the NPV of the decision to change credit policies is:

$$\text{NPV} = -[(\$75)(3,400) + (\$37)(3,460 - 3,400)] + \$23,040/0.020$$

$$\text{NPV} = \$894,780.00$$

Problem 29.6 Credit Policy

4 points total

The Silver Spokes Bicycle Shop has decided to offer credit to its customers during the spring selling season. Sales are expected to be 330 bicycles. The average cost to the shop of a bicycle is \$230. The owner knows that only 95 percent of the customers will be able to make their payments. To identify the remaining 5 percent, the company is considering subscribing to a credit agency. The initial charge for this service is \$570, with an additional charge of \$6 per individual report.

a. Compute the net savings. 3 points

Net savings	\$	1,245 ± .1%
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b. Should she subscribe to the agency? 1 point

Yes

No

**Explanation:**

If the cost of subscribing to the credit agency is less than the savings from collection of the bad debts, the company should subscribe. The cost of the subscription is:

$$\text{Cost of the subscription} = \$570 + \$6(330)$$

$$\text{Cost of the subscription} = \$2,550$$

And the savings from having no bad debts will be:

$$\text{Savings from not selling to bad credit risks} = (\$230)(330)(0.05)$$

$$\text{Savings from not selling to bad credit risks} = \$3,795$$

So, the company's net savings will be:

$$\text{Net savings} = \$3,795 - 2,550$$

$$\text{Net savings} = \$1,245$$

The company should subscribe to the credit agency

## CH 13

13 points total

### Problem 13.1 WACC

5 points total

Kose Inc. has a target debt–equity ratio of 0.89. Its WACC is 11.5 percent, and the tax rate is 34 percent.

- a. If Kose’s cost of equity is 15.50 percent, what is its pretax cost of debt? **3 points**

Pretax cost of debt  %

- b. If instead you know that the aftertax cost of debt is 6.30 percent, what is the cost of equity? **2 points**

Cost of equity  %

#### ***Explanation:***

- a. Using the equation to calculate WACC, we find:

$$\text{WACC} = 0.115 = (1/1.89)(0.155) + (0.89/1.89)(1 - 0.34)r_B$$

$$r_B = 0.1061 \text{ or } 10.61\%$$

- b. Using the equation to calculate WACC, we find:

$$\text{WACC} = 0.115 = (1/1.89)r_s + (0.89/1.89)(0.063)$$

$$r_s = 0.1613 \text{ or } 16.13\%$$

Problem 13.2 SML and WACC

**8 points total**

An all-equity firm is considering the following projects:

Project	Beta	Expected Return
W	0.77	10.2%
X	0.92	10.4
Y	1.16	11.6
Z	1.54	15.4

The T-bill rate is 7 percent, and the expected return on the market is 11 percent.

a. Which projects have a higher expected return than the firm's 11 percent cost of capital? **2 points**

- Projects X and Z.
- Projects X and Y.
- Projects Y and Z.

b. Which projects should be accepted? **4 points**

- Projects W and Z.
- Projects X and Y.
- Projects W and X.

c. Which projects would be incorrectly accepted or rejected if the firm's overall cost of capital was used as a hurdle rate? **2 points**

would be incorrectly rejected;  would be incorrectly accepted.

**Explanation:**

a.  
Projects Y and Z.

b.  
Using the CAPM to consider the projects, we need to calculate the expected return of each project given its level of risk. This expected return (cost of financing) should then be compared to the expected return of the project. If the return calculated using the CAPM is lower than the project expected return, we should accept the project; if not, we reject the project. After considering risk via the CAPM:

$$E[W] = 0.07 + 0.77(0.11 - 0.07) = 0.1008 < 0.102, \text{ so accept W}$$

$$E[X] = 0.07 + 0.92(0.11 - 0.07) = 0.1068 > 0.104, \text{ so reject X}$$

$$E[Y] = 0.07 + 1.16(0.11 - 0.07) = 0.1164 > 0.116, \text{ so reject Y}$$

$$E[Z] = 0.07 + 1.54(0.11 - 0.07) = 0.1316 < 0.154, \text{ so accept Z}$$

c.  
Project W would be incorrectly rejected; Project Y would be incorrectly accepted.

## CH 16

25 points total

### Problem 16.1 EBIT and Leverage

12 points total

Money Inc. has no debt outstanding and a total market value of \$179,000. Earnings before interest and taxes, EBIT, are projected to be \$17,000 if economic conditions are normal. If there is strong expansion in the economy, then EBIT will be 22 percent higher. If there is a recession, then EBIT will be 60 percent lower. Money is considering a \$71,000 debt issue with an 7.00 percent interest rate. The proceeds will be used to repurchase shares of stock. There are currently 3,000 shares outstanding. Ignore taxes for this problem.

- a. Calculate earnings per share, EPS, under each of the three economic scenarios before any debt is issued. Also calculate the percentage changes in EPS when the economy expands or enters a recession. **6 points**

	Recession	Normal	Expansion
EPS	\$ 2.27 ± 1%	\$ 5.67 ± 1%	\$ 6.91 ± 1%
%ΔEPS	-60.00 ± 1% %		22.00 ± 1% %

- b. Calculate earnings per share, EPS, under each of the three economic scenarios assuming the company goes through with the recapitalization. Also calculate the percentage changes in EPS when the economy expands or enters a recession assuming that Money goes through with recapitalization. **6 points**

	Recession	Normal	Expansion
EPS	\$ 1.01 ± 1%	\$ 6.65 ± 1%	\$ 8.71 ± 1%
%ΔEPS	-84.79 ± 1% %		31.09 ± 1% %

### Explanation:

a.

A table outlining the income statement for the three possible states of the economy is shown below. The EPS is the net income divided by the 3,000 shares outstanding. The last row shows the percentage change in EPS the company will experience in a recession or an expansion economy.

	Recession	Normal	Expansion
EBIT	\$ 6,800	\$ 17,000	\$ 20,740
Interest	0	0	0
NI	\$ 6,800	\$ 17,000	\$ 20,740
EPS	\$ 2.27	\$ 5.67	\$ 6.91
%ΔEPS	-60.00	—	+22.00

b.

If the company undergoes the proposed recapitalization, it will repurchase:

Share price = Equity / Shares outstanding

Share price = \$179,000/3,000

Share price = \$59.67

Shares repurchased = Debt issued / Share price

Shares repurchased = \$71,000 / \$59.67

Shares repurchased = 1,189.94

The interest payment each year under all three scenarios will be:

Interest payment =  $\$71,000(0.07) = \$4,970$

The last row shows the percentage change in EPS the company will experience in a recession or an expansion economy under the proposed recapitalization.

	Recession	Normal	Expansion
EBIT	\$ 6,800	\$ 17,000	\$ 20,740
Interest	4,970	4,970	4,970
NI	\$ 1,830	\$ 12,030	\$ 15,770
EPS	\$ 1.01	\$ 6.65	\$ 8.71
%ΔEPS	-84.79	—	+31.09

Problem 16.2 Break-Even EBIT

13 points total

Rolston Corp. is comparing two different capital structures, an all-equity plan (Plan I) and a levered plan (Plan II). Under Plan I, Rolston would have 141,000 shares of stock outstanding. Under Plan II, there would be 94,000 shares of stock outstanding and \$1.410 million in debt outstanding. The interest rate on the debt is 10.00 percent and there are no taxes.

- a. If EBIT is \$296,000, what are the EPS estimates for the two plans? 4.5 points

Earnings per share under plan I	\$	2.10 ± 1%
Earnings per share under plan II	\$	1.65 ± 1%

- b. If EBIT is \$1,100,000, what are the EPS estimates for the two plans? 4.5 points

Earnings per share under plan I	\$	7.80 ± 1%
Earnings per share under plan II	\$	10.20 ± 1%

- c. What is the break-even EBIT? 4 points

Break-even EBIT	\$	423,000.00 ± 0.1%
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**Explanation:**

a. Under Plan I, the unlevered company, net income is the same as EBIT with no corporate tax. The EPS under this capitalization will be:

$$\text{EPS} = 296,000 / 141,000 \text{ shares}$$

$$\text{EPS} = \$2.10$$

Under Plan II, the levered company, EBIT will be reduced by the interest payment. The interest payment is the amount of debt times the interest rate, so:

$$\text{NI} = \$296,000 - 0.10(\$1,410,000)$$

$$\text{NI} = \$155,000.00$$

And the EPS will be:

$$\text{EPS} = \$155,000 / 94,000 \text{ shares}$$

$$\text{EPS} = \$1.65$$

Plan I has the higher EPS when EBIT is \$296,000.

b. Under Plan I, the net income is \$1,100,000 and the EPS is:

$$\text{EPS} = \$1,100,000 / 141,000 \text{ shares}$$

$$\text{EPS} = \$7.80$$

Under Plan II, the net income is:

$$\begin{aligned} \text{NI} &= \$1,100,000 - 0.10(\$1,410,000) \\ \text{NI} &= \$959,000.00 \end{aligned}$$

And the EPS is:

$$\begin{aligned} \text{EPS} &= \$959,000.00 / 94,000 \text{ shares} \\ \text{EPS} &= \$10.20 \end{aligned}$$

Plan II has the higher EPS when EBIT is \$1,100,000.

**c.**

To find the breakeven EBIT for two different capital structures, we simply set the equations for EPS equal to each other and solve for EBIT. The breakeven EBIT is:

$$\begin{aligned} \text{EBIT} / 141,000 &= [\text{EBIT} - 0.10(\$1,410,000)] / 94,000 \\ \text{EBIT} &= \$423,000 \end{aligned}$$