

2017

BCG Potential Test

Sample Test 3



Consulting Prep

Think like a top consultant

OVERVIEW

The test assesses a number of key skills like logic, analysis and business sense. The actual online test has 23 questions multiple choice questions and lasts 45 minutes. Use of a calculator and other electronical devices are not allowed during the test.

The sample contains 10 sample questions by BCG. They are intended to familiarize you with the format and navigation of the test. You should complete them in 20 minutes.

The screen is divided into 2 parts:

- On the left, you will find the questions and the multiple choice answers
- On the right, you will find the documents to which you have access

The navigation allows you to move forward and backwards through the case, as needed. You may change your responses before time runs out. In some questions, you can click on one or more answers. At the end of the 45 minutes, you will need to quit the case.

The score is +3 points for every right answer, 0 points for no answer and -1 point for a wrong answer.



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QUESTION 1 / 10

What is the current cost per sale for PayCo assuming all lead sources have the same conversion rate?

1. **\$39 / sale**
2. **\$44 / sale**
3. **\$49 / sale**
4. **\$54 / sale**

CURRENT LEAD MIX: COST PER SALE

Case overview

PayCo is a payments company that processes debit card and credit card transactions in the United States.

PayCo's clients are shops such as restaurants, bars, apparel shops, supermarkets, petrol stations, etc.

The company rents debit and credit card machines to its clients. It earns a rental fee for the card machines as well as a small fee for each card transaction processed by their client.

The company works with banks to acquire new clients. It purchases lists of businesses from them and calls them to sell card machines and services.

PayCo purchases lists of leads at different prices from Alma Bank, Bingo Bank and Com Bank.

Current situation

	Cost per lead (\$)	Share of total mix of leads (%)
Alma Bank	\$5	30%
Bingo Bank	\$3	60%
Com Bank	\$6	10%

Sales representatives call the leads to try and sell them card machines and services. The average conversion rate from lead to actual customer is about 10%. The conversion rate is driven by:

1. The quality of leads provided (lead needs service, can afford it, etc.)
2. The effort the sales agent puts in (time spent, skills, etc.)

Sales representatives are organised in three teams (one per bank). Each lead is handled by one single sales representative.

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QUESTION 2 / 10

Which of the following statements would explain why the conversion rate changes from bank to bank:

- a. The number of representatives per team varies
- b. The sales representatives salaries and bonuses vary
- c. The type of business the lead is in varies
- d. The working hours of individual sales agents vary

- 1. Option b
- 2. Options a and b
- 3. Options a, b and c
- 4. Options b, c and d

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QUESTION 3 / 10

Assuming PayCo buys leads from all three banks, what is the maximum conversion rate it could achieve?

1. 10.5%
2. 11.2%
3. 11.8%
4. 12.3%

NEW LEAD MIX: COST PER SALE

Bank by bank analysis

Alma Bank is a large commercial bank from the East Coast of the US. Its clients are mainly restaurants and shops.

Com Bank has got a similar list of clients to Alma Bank but is established on the West Coast of the US.

Bingo Bank is established in the Midwest and primarily serves Mom and Pop businesses.

The team at PayCo has always assumed a similar conversion rate of 10% across all three banks.

Conversion rate results

After carrying out some research, your team finds out that the conversion rate actually differs between the three banks.

PayCo needs to achieve its sales target by using no more than 300,000 leads per year.

	Conversion rate	# of leads available per year
Alma Bank	12%	100,000
Bingo Bank	8%	600,000
Com Bank	15%	80,000

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QUESTION 4 / 10

What would be the average cost per sale for PayCo if it sourced leads from the three banks in a way that maximises sales?

1. **\$35.0 / sale**
2. **\$37.5 / sale**
3. **\$39.9 / sale**
4. **\$39.6 / sale**

NEW LEAD MIX: COST PER SALE

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QUESTION 5 / 10

Assume that the average annual revenue per customer for PayCo is \$100, and that it chooses the mix of leads that maximises average conversation rate.

What percentage difference in profit margin would result from this choice compared to a 10% conversion rate across all banks?

1. 0.98%
2. -0.98%
3. 1.20%
4. -1.20%

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QUESTION 6 / 10

Assume that the average annual revenue per customer for PayCo is \$100, and that it chooses the mix of leads that maximises average conversation rate.

What would be the change in total profits compared to the current situation?

1. \$0.2M increase
2. \$0.2M decrease
3. \$0.3M increase
4. \$0.3M decrease

NEW LEAD MIX: COST PER SALE

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QUESTION 7 / 10

Which of the following quantities, in addition to the cost per lead, would you need in order to calculate the full cost per sale:

- a. Hourly wage of sales representative
- b. Number of leads processed per sales representative per hour
- c. Number of sales representatives in each team
- d. Number of sales managers in each team

- 1. Option a
- 2. Options a and b
- 3. Options c
- 4. Options c and d

SALE REPRESENTATIVES' INCENTIVES

Day to day

PayCo's sales representatives work from 9am to 5pm from Monday to Friday 47 weeks a year.

Sales representatives are divided into three teams. Each team deals with one of the following lead sources: Alma Bank, Bingo Bank and Com Bank.

Every day, sales representatives receive a list of 85 leads from their respective bank and work through the list during the day.

The list of leads they get are newly setup businesses which are likely to require debit and credit card payment processing services.

Sales representatives simply cold-call the leads and try to convince them to sign up for PayCo services.

Sale representatives' compensation

The sales representatives' base salary starts at \$40k and increases by about 5% per year for each additional year they stay with the company.

In addition, sales representatives can receive \$10 for each sale they make.

The Head of Sales has noticed that sales representatives for Bingo Bank are much less motivated than their peers on average.

After investigating, he found that these sales representatives have been consistently generating lower sales and receiving smaller bonuses than their peers.

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QUESTION 8 / 10

Which of the following statements would NOT solve the motivation problem of the sales representatives in the Bingo Bank team?

1. **Work with Bingo Bank to increase the quality of the leads purchased from them by PayCo**
2. **Group sales representatives handling different banks in a single team and randomise the allocation of leads between them**
3. **Keep sales representatives in different teams but rotate lead sources between them**
4. **Increase bonuses to \$20 per sale for all sales representatives**

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QUESTION 9 / 10

Which of the following measures would best help the company to fully prevent sales representatives from agreeing unprofitable prices with future customers?

1. **Train sales representatives to negotiate better prices with leads**
2. **Fine sales representatives when they give unprofitable prices**
3. **Incentivise sales representatives to sell at higher prices with a different bonus system**
4. **Set up an audit team that would check prices and validate contracts before they count towards sales representatives' total sales**

INCENTIVE STRUCTURE

Current issue

Sales representatives are currently only incentivised based on the number of customers they manage to sell to.

The head of finance of the group has noticed that the prices at which sales representatives agreed to provide PayCo's services have decreased in the past few months.

The head of sales suspects that this might be due to sales representatives selling at increasingly lower prices to increase their bonus.

Pricing

When selling PayCo's services, sales representatives negotiate a share of their customers' future revenue.

For debit cards, they usually agree a price of about 15 cents per future transaction processed for the client. For instance, if PayCo processes a debit card transaction for a sandwich at \$5, they will receive 15 cents from the sandwich shop in exchange for their service.

For credit cards, the price agreed is a percentage of the transaction instead of a fixed fee. This percentage is usually around 1.5%. The average split of debit and credit card transactions is 40-60 (debit – credit).

Lately, sales representatives have been found to sell PayCo's services at increasingly less profitable prices.

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QUESTION 10 / 10

Which of the following statements is supported by the information available to you?

1. **PayCo would achieve higher revenues if all transaction fees came from debit cards**
2. **Credit card transactions contribute more to PayCo's annual revenues than debit card transactions**
3. **Leads from Alma Bank contribute more to PayCo's revenues compared to leads from Com Bank**
4. **None of the above / we lack sufficient information**

INCENTIVE STRUCTURE

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CORRECT ANSWERS

Question 1 – 1

This calculation can be broken down into two steps:

1. Calculate cost per lead
2. Calculate cost per sale

The cost per lead needs to be calculated across all three banks, taking into account their total share of mix: $\$5 \times 30\% + \$3 \times 60\% + \$6 \times 10\% = \$3.9 / \text{lead}$

The cost per sale can be calculated by dividing the cost per lead by the conversion rate: $\$3.9 / 10\% = \39.0 .

CORRECT ANSWERS

Question 2 – 4

The conversion rate depends on two drivers: the quality of leads provided and the effort put in by the sales agents. Each answer needs to be evaluated against the two drivers. Also note that each lead is handled by a single sales agent.

- Increasing the number of representatives can increase the volume of leads handled but not the conversion rate as each lead is dealt with by a single agent
- The sales agents' salaries and bonuses directly influence the effort they put in and therefore the conversion rate
- The type of business the leads is in influences the quality of the lead. For instance, if the business is a van that sells ice cream, it probably will not accept debit cards and therefore is not a good potential lead
- The working hours of sales representatives directly impacts the effort they put in

Therefore options b, c and d impact the conversion rate and so answer 4 is the correct answer.

CORRECT ANSWERS

Question 3 – 2

In order to maximise its conversion rate, PayCo needs to rank lead sources from the highest to the lowest conversion rates. It should then use as many leads from the first source before considering the second one:

1. Com bank 15%; 80,000 leads available
2. Alma bank 12%; 100,000 leads available
3. Bingo bank 8%; 600,000 leads available

PayCo needs 300,000 leads per year to meet its target sales. To maximise the conversion rate, the lead mix should then be:

1. Com bank: 80,000
2. Alma bank: 100,000
3. Bingo bank: 120,000

The maximum conversion rate achievable is then: $(15\% \times 80,000 + 12\% \times 100,000 + 8\% \times 120,000) / 300,000 = 11.2\%$

CORRECT ANSWERS

Question 4 – 3

The maximum sales target is the one that can be achieved by using the maximum conversion rate based on the available leads. The average cost per sale can be calculated as: the sum of the number of sales based on the number of leads per bank from question 3 and the conversion rate multiplied with the cost per sale per bank and divided by the total number of sales (weighed average).

Sales per bank:

1. Alma bank: $100,000 \times 12\% = 12,000$
2. Bingo bank: $= 120,000 \times 8\% = 9,600$ sales
3. Com bank: $80,000 \times 15\% = 12,000$ sales

The cost per sale can be calculated by dividing the cost per lead by the conversion rate:

1. Alma bank: $\$5 / 12\% = \41.7
2. Bingo bank: $\$3 / 8\% = \37.5
3. Com bank: $\$6 / 15\% = \40

Therefore the average cost per sale is:

$$((12,000 \times \$40) + (12,000 \times \$41.7) + (9,600 \times \$37.5)) / (12,000 + 12,000 + 9,600) = \$39.9$$

CORRECT ANSWERS

Question 5 – 2

This question can be solved using a three-step approach:

1. Calculate the profit margin with a 10% conversion rate across all banks
2. Calculate the profit margin using the average cost per sale
3. Calculate the percentage difference between the two margins

The cost per sale for 10% conversion rate is \$39 according to Question 1. As a consequence, the current margin is $(\$100 - \$39) / (\$100) = 61\%$

The average cost per sale is \$39.6 according to Question 4. The profit margin would therefore become $(\$100 - \$39.6) / (\$100) = 60.4\%$

The percentage difference is therefore $(60.4\% - 61\%) / (61\%) = -0.98\%$

CORRECT ANSWERS

Question 6 – 1

To calculate total profits in each situation we need to:

1. Calculate the number of customers: # of leads x conversion rate (A)
2. Calculate the revenues for all customers: (A) x \$100 (B)
3. Calculate profits: (B) x profit margin for each situation

Profits in the current situation are:

$$300,000 \times 10\% \times \$100 \times 61\% = \$ (300,000 \times 6.10)$$

Profits with the maximum conversion rate are

$$300,000 \times 11.2\% \times \$100 \times 60.4\% = \$ (300,000 \times 6.76)$$

The difference between the two is therefore:

$$(300,000 \times 6.76) - (300,000 \times 6.10) = 300,000 \times 0.66 = \$198,000 \approx \$0.2M$$

CORRECT ANSWERS

Question 7 – 2

The cost per sale calculated in previous questions only includes the cost related to the purchase of leads from the different banks. It does not include the cost related to the sales force.

Calculating the full cost per sale would require knowing how much sales representatives cost per customer acquired. The different answers need to be evaluated against this criterion:

- a. The hourly wage of sales representatives would be helpful to calculate the cost of sales per customer acquired
- b. The number of leads processed per hour per agent would also be helpful, as it would allow you to calculate the cost allocation between the different leads
- c. The number of sales reps per team would not be helpful as each lead is handled by a single agent
- d. The number of sales managers would not help determining the sales cost per customer acquired

CORRECT ANSWERS

Question 8 – 4

The head of sales' initial conclusion is that sales representatives handling Bingo Bank leads "have been consistently making less sales and getting lower bonuses than their peers".

Indeed, the conversion rate for leads from Bingo Bank is lower than that for other banks. The comment implies that, to increase sales representatives' satisfaction, their bonus would need to be similar relative to their peers.

However, if bonuses increase to \$20 per sale for all sales representatives, the relative bonus obtained by sales representatives focused on Bingo Bank will not increase.

Answer 4 would therefore not help solve the problem and is the correct answer.

CORRECT ANSWERS

Question 9 – 4

Answers 1 to 3 would all help decrease sales representatives' tendency to sell at unprofitable prices. However, none of them would completely stop the trend:

1. Training sales representatives to give better prices could still result in sales representatives giving unprofitable prices in practice.
2. Giving a fine to sales representatives, while a good incentive, is not guaranteed to fully stop the trend.
3. Similarly, setting up a better incentives scheme is also not guaranteed to halt the trend.

Answer 4 is the correct answer because it fully prevents sales representatives from selling at unprofitable prices via an external audit team.

CORRECT ANSWERS

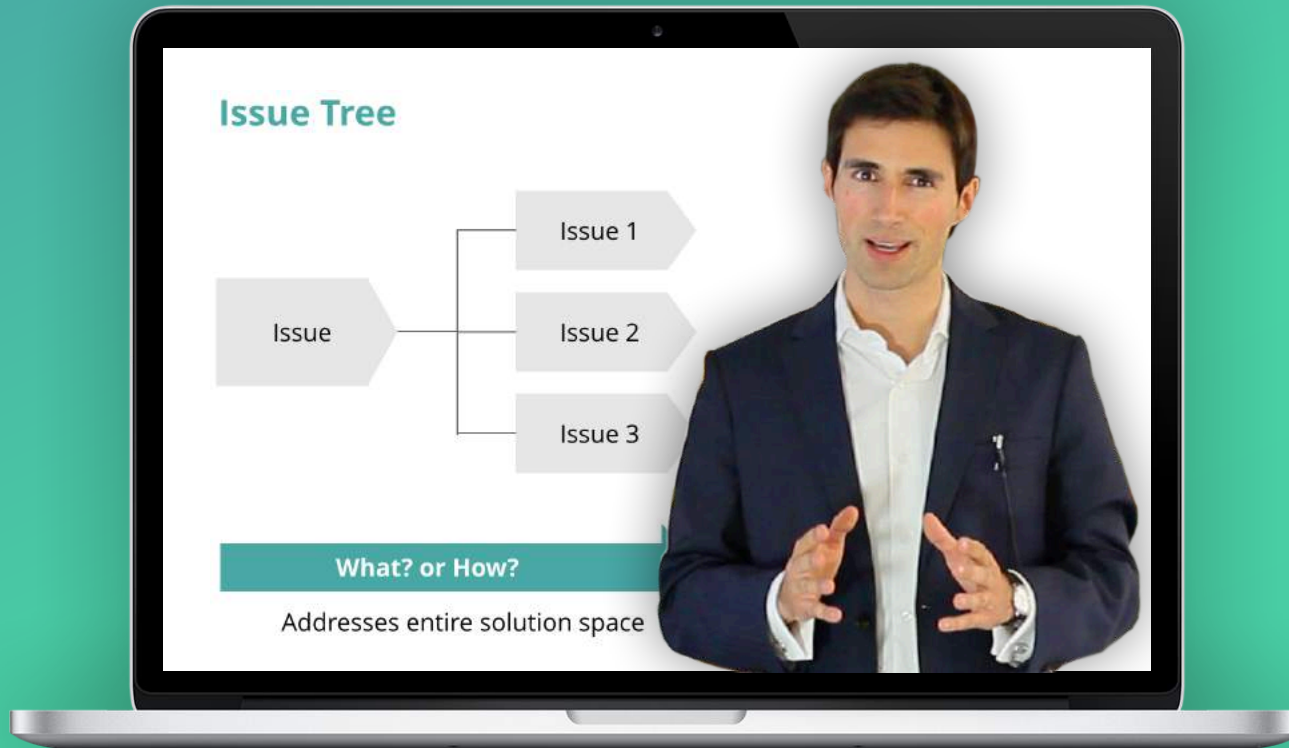
Question 10 – 4

None of the first three options is completely accurate based on the information we have:

1. PayCo makes 15 cent for every debit card transaction and 1.5% for every credit card transaction. For every transaction higher than \$10 PayCo therefore receives a higher fee from credit cards. We do not know the average transaction size and therefore cannot conclude.
2. We know that the debit / credit card split is 40% / 60%. However we do not know the average debit / credit card transaction size. As a consequence, we cannot conclude if answer 2 is correct or not.
3. We know that leads from Alma Bank are mainly restaurants and shops and that leads from Bingo Bang are mainly Mom and Pop businesses. However, we do not have any information on the volume and type of transactions these businesses make. We cannot conclude that this statement is true.

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