Profit and Loss

SUBMITTED BY: Nina Hoe, University of Pennsylvania

SUBJECT(S): Computation

GRADE LEVEL(S): 9, 10, 11, 12

☰ OVERVIEW:

This lesson starts with a brief overview of the concept of break even, revenues and expenses. (If you have completed the previous lessons in this module, you can skip this intro or review quickly.) Students are asked to think about the break-even point and what is happening with a company's finances on other sides of this point. The class discusses what it means to make a profit and the meaning of a loss. Students read relevant Knowledge@Wharton articles to answer questions and complete computations about particular profit and loss situations. Finally, students discuss these implications.

☰ NBEA STANDARD(S):

- Computation, I. Mathematical Foundations
- Computation, II. Number Relationships and Operations
- Computation, III. Patterns, Functions, and Algebra

☰ RELATED ARTICLES:

- "The Silicon Valley Start-up that Began with Legos and a Market Need"
- "Research Strategies for New Investors"
- "Mark Cuban's 'Mini-Me' on What It's Like to Work with an Investor"
- "Introducing the Latest Stock Market Debutante: #TWTR"
- "Educator Toolkit: Inside Silicon Valley"

Objectives/Purposes:

- Students understand the meaning of profit and loss in an income statement.
- Students calculate how different businesses generate profits.
- Students calculate losses in different business situations.

Knowledge@Wharton Articles:

- "How sustainable is Groupon's Business Model?"
- "Power to the People or Just a Fad? Forecasting the Future of Group Buying Sites"
- "Can Twitter Promote Itself into Profitability?"

Other Resources/Materials:

- Calculators
- Student Worksheet

Activity:

1. Whole Class Discussion:

(If you taught the previous Pricing and Break Even lessons skip to question #11)

1. What do you think it means to "break even"? Have you heard this term before?

Play the Wharton Global Youth Program (WGYP) Glossary: Break Even

"Break even is when revenues and expenses are equal. Or, put another way, when net income is zero. The Bluth Company is projected to break even, at selling 100,000 tables. If they sell fewer tables, they'll make a loss. If they sell more tables, they'll make a profit."

Play the WGYP Glossary: Break Even Point

"Break even point refers to either the quantity of output sold, or the total revenues where operating income is zero. The Bluth Company's break even point in quantity is 100,000 tables, and in sales dollars, is $1 million."

Essentially, the break-even point is when:

Revenues = Expenses

Revenues – Expenses = 0 (or the Net Income = 0)

2. What are revenues?

Play the WGYP Glossary: Revenues

"Revenues are the sales of products, merchandise and services that a company makes to customers due to the normal business activities. The Philadelphia Phillies, the 2008 World Series Champions, generated a record-breaking $216 million in revenues from ticket sales, merchandise, and refreshments last year."

3. What are expenses?
4. What are fixed vs. variable expenses/costs?

Play the WGYP Glossary: Fixed/Variable Cost

"A fixed cost is a cost that remains unchanged in total, regardless of changes in the level of total activity or volume. Earthquake insurance for a table factory is a fixed cost, because regardless of whether 200 or 2000 tables are made, the cost for earthquake insurance will be the same. A variable cost is a cost that changes directly in proportion to changes in the level of total activity, or volume. The wood used to make a table is a variable cost, because each additional table requires additional wood for the tables to be made."

5. If you ran a corner store – what would your **revenues** be?
   (your total sales, how much money was in the register at the end of each day)
6. If you ran a corner store – what would you **fixed expenses** be?
   (paying employees, rent for the space or mortgage, utilities, etc)
7. If you ran a corner store – what would you **variable expenses** be? ***(cost of food and merchandise to stock the shelves, potentially adding additional employees if the need got high enough)***

Different businesses have different profiles and different relationships between and proportions of fixed and variable.

    8. Why is knowing your break-even point important?
    9. What does it mean if revenues are greater than expenses?
   10. What does it mean if revenues are less than expenses?

Every start-up business has to anticipate that in the beginning, the expenses will be larger than the revenues and that they business will essentially be losing money initially. Business owners and investors look to break-even projections to analyze the risk involved with starting a particular business. Companies think about break-even points in different ways, and ask different questions regarding breaking even. Sometimes, a new company will expect that expenses will exceed revenues in the beginning, so they may ask – given this **pricing** strategy, at what point in time will we reach a break-even point? Another company may use the break-even point as a goal, and ask – if we want to break even within three years, what pricing strategy must we use?

Play the WGYP Glossary: Pricing

"Pricing is the price a firm sets for the products it sells. Wal-Mart has a pricing policy to be as low or lower than any of the competitors. Wal-Mart will match or beat anyone's prices."

There are also initial, start-up, or capital costs or investments involved in starting a business that may not be figured into the monthly expenses. (Also discuss sunk costs.) For example, to start up a corner store, you would need to invest in shelving, a price gun, signage, etc.

(Start here if you have already taught Computations 29 – 31) – 5 mins

   11. What does it mean for a company to make a profit?
   12. What does it mean for a company to take a loss?
   13. What needs to happen in order for a company to make a profit?
   14. Under what circumstances do companies experience loss?
   15. How and where does a company report their profit and losses?

An **income statement** is where a company reports its profits and losses over a given period of time (i.e. monthly, quarterly, or yearly). An income statement shows the **net income**, which is the total revenues and gains minus the total expenses and losses. If this number is positive, the

company has made a **profit** in that given period of time. If that number is negative, the company has experienced a loss.

Play the WGYP Glossary: Net Operating Losses

"Net operating losses, or NOLs, are the accumulated losses of a business that can be used to reduce income reported to the tax authorities in other years. Start-up companies usually have substantial net operating losses, because it takes a couple of years for a new business to become profitable."

(The class can be split into 2 groups to work on problems and issues having to do with Twitter and Groupon. Give students 20 minutes to work in teams and then 10 minutes to report back to the class about the companies and their profit/loss situations/implications.)

2. Small Group/Pair Activity:

Read articles and learn about Twitter and Groupon.

Guided Reading Questions:

- How do these companies generate revenue?
- Who are their customers?
- What are the incentives, advantages and disadvantages for customers?

Read the KW article Can Twitter Promote Itself into Profitability?

When Twitter began, it received start-up money from **venture capitalists** in Silicon Valley. These investors did this in exchange for partial ownership in the company, and of course hoping that the company would increase in size.

1. Based on the article, what do business analysts think about Twitter's use of advertising?

2. Prior to experimenting with advertising, what were Twitter's revenues?
   (nothing)

3. In the past and present, what might be some of Twitter's expenses?
   (bandwidth, staff, computers)

4. • Ultimately, what are things that Twitter could do to generate income?
   (advertising)

   • How might these initiatives affect the expenses (fixed or variable) for the company?

5. What will be the break-even point for Twitter?
   (when revenues = expenses)

6. Given what you have learned about new businesses and net operating losses, what is a likely beginning to Twitter generating revenue?
   (that expenses will exceed revenues)

7. Twitter is now offering advertising in three forms: Promoted Tweet, Promoted Trends, and Promoted Accounts. As described in the article, Twitter experimented with Promoted Tweets with Starbucks in 2010. What are some things that Twitter can say about their own company to attract potential advertiser?
   (they have 17 million users.)

8. How do you think Twitter users may react to advertising on Twitter?
   (they may not like it.)

Calculations:

9. A company's annual operating expenses are $9 million. In their first year of operation, revenues are $2 million, what are the first year net operating losses?
   ($7 million)

10. This same company expects to increase revenues by $1.5 million each year, while expenses are expected to stay the same. During which year will the company break even?
    (Revenues: Year 1 – $2 million, Year 2 – $3.5 million, Year 3… see below – End of Year 5 à Year 6)

11. Fill in the table below to visualize this relationship during the first 8 years

Year	Revenues
1	$2,000,000
2	*$3,500,000*

3	$5,000,000
4	$6,500,000
5	$8,000,000
6	$9,500,000
7	$11,000,000
8	$13,000,000

12. When will the company start to generate a profit?

    (Year 6)

13. This same company actually expects revenues to double each year. During which year will the company break even?

    (2 mil, 4 mil, 8 mil, 16 mil... so between the 3rd and 4th years)

14. When will the company start to generate a profit?

    (4th year)

Read the KW article How sustainable is Groupon's Business Model? (and Power to the People or Just a Fad? Forecasting the Future of Group Buying Sites, if time allows.)

Groupon is a group buying site, where Internet users can purchase gift certificates for businesses online at extreme discounts along with other online customers.

The way this works is they go to merchants [and] say, "I am willing to sell some of your inventory and I am going to take a cut out of [the profit]. But you're going to have to give me a deep discount. If you don't give me a deep discount, we're not going to make it available to people." To some degree, they are operating just like a retailer. I am going to buy volume, I'm going to break that down and sell it to individual customers. And I'm going to sell it to those individual customers for more than what it cost me. That's exactly how every retailer operates. The difference is they are not buying any of the inventories. They are just a reseller.

15. What is a sustainable business model?

    (where the revenues can pay the expenses)

16. What are the concerns about Groupon's ability to generate revenue?

    (that it might be a fad)

17. The article mentioned the Groupon's annual revenues of between $3 and $4 million. What is their net income? How can you tell?

    (article does not say)

18. If Groupon's expenses were $5 million per year, what would their net income be?

    (loss of $1 to $2 million per year)

According to "Power to the People or Just a Fad? Forecasting the Future of Group Buying Sites," retailers face challenges from this model.

For example, Groupon negotiates with a small business to offer steep discounts, usually half off or more, and then takes 50% of the resulting sales. That leaves the business with at most 25% of sales to cover overhead and product or service costs. For many shops, that means the business will barely earn a profit or even lose money. If a spa offers 50% off a $100 massage, for example, sales would be $50 per customer and Groupon takes $25. That leaves the spa with $25. Let's say after paying the massage therapist and covering overhead and other costs, the spa loses $20 per customer. If 200 people bought the voucher and 70% redeem it, the spa's loss would be $1,300.

19. Why would a retailer choose to take such a loss?

    (to get initial interest in the business, get customers in the door)

20. Are there ever benefits to taking a loss?

    (if it generates business)

21. If a retailer offers a Groupon to online customers for $20 for $30 worth of merchandise, and Groupon charges them $10 on each sale, what is the retailer's overall revenue if it sells 300 Groupons?

    ($10 per sale, so 10 x 300 = $3,000)

22. This retailer's pricing strategy involves selling inventory at a 100% mark-up from the wholesale cost. What is the cost or expense to the retailer to provide $30 worth of merchandise?

    ($15)

23. What is the cost to the retailer to provide $30 x 300 of merchandise?

    (actually $15 x 300 = $4,500)

24. How much income would this retailer gain or lose from offering this deal?

    (loss of $1,500)

25. If only 80% of the people who purchased the Groupon actually redeemed it, how many people used the Groupon in the store?

    (.8 x 300 = 240 people)

26. How does that change the retailers' revenues? (This means that the online customer buys the Groupon for $20, and automatically the company Groupon takes $10 and gives the rest to the retailer.)

    (revenues stay the same = $3,000)

27. How does this affect the cost of supplying the merchandise? ($30 to the # of people who redeemed.)

    ($15 x 240 = $3,600)

28. How much income does the retailer gain or lose from offering this deal when only 80% of people actually redeem?

    (loss of $600)

Tying It All Together: (*10 mins*)

<u>Whole Class Discussion</u>:

1. What is the relationship between the break-even point, and profit and loss?
2. How is profit generated?
3. What are things companies can do to generate or increase profit?
4. What is a sustainable business model?
5. Any questions?

Practice Outside of the Classroom: Look at online companies to see how they generate profit.

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