

A Cost Accounting Case Study: Doughnut Stand Feasibility

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ABSTRACT

This is a practical case study exploring the feasibility of a mini-Doughnut shop. It is designed for a managerial accounting student to work through a comprehensive problem that follows the format of most Cost Accounting textbooks. One problem is aligned to each chapter required in most basic cost accounting courses. This project was designed to either replace a mid-term exam, or to supplement textbook materials using relevant costs and functions that a small business owner would consider when starting a small doughnut shop.

Keywords: case study, cost accounting, introductory, problems, relevant costs

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INTRODUCTION

The gap between the skills college graduate requirements and what students need to succeed at their new careers is very real (Strauss, 2016). This is a common theme among new graduates who are coming into real world markets unprepared for the skills necessary to perform; there appears to be a disconnect between the jobs they eventually secure and the skills they have learned thus far (Strauss, 2016). This finding has led educators to determine whether a traditional lecture-based approach to learning is in fact the best course of action. Or if there is a necessity to shift to a case or problem-based curriculum to try and instill those hard skills that graduates are lacking as they enter the workforce. Texas A&M University conducted a case study trying to demonstrate how understanding cost concepts and their practical application is a fundamental requirement of managerial accounting (Gates & Burke, 2015). In terms of retention, a student's ability to understand various accounting functions is more impactful when they gain a deeper practical understanding (Gates & Burke, 2015). The reader is no longer a passive observer but is transformed into an active participant (Honan & Sternman-Rule, 2002). This case study builds on that principle and provides a comprehensive understanding of the course objectives by providing a hands-on learning experience for students. The goal of completing this case study is that students walk away feeling as though they have mastered the complex topics of managerial accounting in a way that can be translated outside of the academic platform and into their careers.

LITERATURE REVIEW

While the goal of case-based learning is to provide real world applications of accounting concepts, the understanding of theoretical cost concepts is still an important factor to consider that will enhance practical problems (Gates & Burke, 2015). The primary learning issues is that students often find textbook material dry; they have not been given the skills to read for retention of the material (Cornell College, n.d.). According to Cornell College, many students make the mistake of picking up their textbook and reading an entire fifty pages, assuming they are done with their reading assignment (Cornell College, n.d.). These students often struggle to grasp concepts. They do not actively participate in class discussion as a result (Cornell College, n.d.). The steps listed below were published in an article by Baylor university, outlines how to become an effective reader (Baylor University, n.d.).

- Preview: Read chapter objectives, headings, subheadings, and summaries.
- Reflect: Read a paragraph at a time, then stop to reflect on key concepts and highlight the pertinent material.
- Review: Talk to yourself or someone else about what you read. Then reviewing within 24 hours helps move information into long term-memory.

Equipping students with these more interactive study tools will instill a strong foundation in the way they retain core information from textbooks (Baylor University, n.d.). This understanding will help enhance their experience as they work through the case study in this project (Baylor University, n.d.).

AICPA CORE COMPETENCIES

The American Institute of Certified Public Accountants (AICPA) developed a Core Competency Framework outlines the skills needed of today's accountants in society. It goes through three pillars of skills: accounting, business, and professional competencies (AICPA, 2018). The accounting competencies include risk assessment, measurement analysis, reporting, system and process management, and technology tools (AICPA, 2018). Hard skills and an understanding of managerial cost concepts and their application on real world scenarios are a part of the accounting core framework. Business competencies include strategic, global, governance, and customer perspective, and process and research management. Professional competencies focus on ethical and professional behavior, decision making, collaboration, leadership, communication, and project management (AICPA, 2018). During an AICPA accounting competition in 2015, University of Kansas students were praised by judge Tommye Barie, CPA for, "demonstrating strong presentation and communication skills, which are important to a successful accounting career" (Schiavone, 2015). Thus, further showcasing the need for an educational approach that does not just focus on lecture-based material, but that of a more practical application of the core competencies outlined by the AICPA. This can be achieved through interactive case study problems.

The argument for the need to integrate more project or case-based learning into education needs perspective from both professors and students alike on what benefits they feel have manifest through this method. According to Illinois Center for Innovation in Teaching and Learning (CITL), the case method approach is effective in employing active learning, involves self-discovery, builds the capacity for critical thinking, models the process of inductive learning from experience, and mimics the real-world applications (Illinois CITL, n.d.). As a result, case studies are a valuable way for learning to occur, as the teacher is learning as well as the students in this interactive model, and the students are more willing to be an active participant and engage in the discussion (Illinois CITL, n.d.).

One professor was able to detail the case-based project that she has successfully used in one of her auditing classes (Illinois CITL, n.d.). She had students focus on a specific case, then turned it into a semester-long group project culminating in a presentation and paper (Pozo, 2019). Professional writing skills are another area where accounting students have historically been lacking, so writing a paper as a part of the case study is a great way to practice those skills (Strauss, 2016). Feedback on this project from Professor Pozo was the assignment was successful as it encourages students to think critically, collaborate, communicate, organize, and do research (Pozo, 2019). These are the core competencies that have been set by the AICPA that are needed in the accounting field.

In another case study example, an accounting student was able to document her own experiences researching the typical accounting student's opportunities in the job market. Her main goal was to, "explore the hiring process and compare it with a student's education" (Marhamo, 2017). She found that an accounting graduate is expected to have adequate knowledge of Microsoft Office processes, communication and writing skills, strong accounting fundamental knowledge, and the ability to work both independently and in a group setting (Marhamo, 2017). Most of these skills are ones that you will not be able to master by just reading about them or being lectured to by a professor; they are hands on skills that are obtained from practicing the craft.

One major issue that professors faced, even more so in this virtual environment, is curating quality testing content that is not available online for students to find (Wotapka, 2018). Case studies may help this endeavor. One appealing aspect of using these test banks is that of time saving factors for professors, but students have found ways to access them with a simple online search (Wotapka, 2018). Studies are finding that students are scoring better on exams but are not retaining the concepts. Thus, this is making it extremely difficult to gauge actual student learning and retention (Wotapka, 2018). These types of issues can be mitigated with the use of case and problem-based learning in managerial accounting. Each student will interpret the assignment a little differently and apply critical thinking and core concepts into the finished product. An answer will not simply be accessed online. Students will have to apply knowledge of the curriculum that has been set by both the textbook and professor guidance to solve the problems in the case study. The case study can be altered each time to ensure answers are not easily accessible.

With all the research validating the success educators are having with case-based instruction, it is worth considering if traditional testing methods are becoming something of the past. The importance of the ability to apply knowledge to the real world in actual case studies demonstrates that memorizing content and reciting it verbatim does not equate to understanding the material (Phan, 2017). Case study projects allow students to apply critical thinking and core concepts of accounting to real world problems (Phan, 2017). Some advantages of moving away from traditional testing is that it allows for some more flexibility on student schedules and alleviates some of the stress that finals week can cause (Lanthorn Editorial Board, 2017). Also, not everyone excels at the high-pressure nature that exams impose. Some of the brightest students can suffer from testing anxiety and score lower than their peers who do well with memorization; however, this does not gauge true understanding of material (Lanthorn Editorial Board, 2017). Case studies mitigate these issues as well.

This case study, Candy's Doughnut Stand Feasibility Study, will provide students with a hands-on approach to a deeper understanding of the core concepts of managerial accounting, and provide them with some of the hard skills that employers say students are lacking as they enter the job market. The case will validate the above ideas, and thus contribute and enhance current accounting literature regarding the effectiveness of project-based instruction over traditional methods as we try to adapt to the needs of the accounting profession.

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DIRECTIONS

This is a comprehensive case study exploring the feasibility of a mini-Doughnut shop. It will cover many of the concepts you studied in this course. This project is worth 100 points and is due on the last day of class. It will take you between 10-15 hours to complete. This is an independent project. You may not discuss this with your classmates. You may submit this in an Excel workbook, Word document or handwrite the solutions and scan the pages. Good luck!

INTRODUCTION

Candy is a graduate student, and she has a major sweet tooth. She and her family love doughnuts, but like many people, they are trying to eat healthier and so felt like they had to give up these tasty treats. However, Candy found an alternative that her family could still enjoy their favorite treat just in a healthier version. She started making miniature baked doughnuts. These are healthier than fried doughnuts, and due to the size are helpful with portion control and calorie intake. Candy's family and friends really love them, so she began to wonder if selling them might be a viable business. She would like to know the feasibility of opening a profitable drive thru gourmet mini doughnut and coffee stand.

PURPOSE OF THIS PROBLEM

This final problem will test your understanding of these Cost topics:

- Use of the 5-step decision making process
- Distinguish between direct and indirect costs
- Distinguish between variable and fixed costs
- Use of the CVP and break-even analysis
- Product mix analysis
- Distinguish between contribution margin and gross margin
- Evaluate data with process costing and job costing
- Use of activity base costing
- Evaluation of budget variances

PRODUCTS

The products planned to be offered are miniature gourmet doughnuts and a full-service coffee menu. Coffee will be offered along with doughnuts because, not only do they pair well, but a recent report from The NDP Group (2020) shows that consumers buy more servings of coffee than doughnuts from doughnut shops. However, for the purposes of this case study we will focus on evaluating the costs of the doughnuts. There will be a variety of flavors but the average cost per doughnut remains the same. Doughnuts can be purchased by the dozen, half dozen or a doughnut-pop (3 doughnuts on a stick).

MARKET

The U.S. doughnut market has seen an average consistent growth of 3.1% over the past few years (IBISWorld, 2019). Market predictions say, "The global doughnuts market accounted

for USD 40.0 billion in 2016 and the market is projected to reach around USD 55.0 billion by 2024, growing at a compound annual growth rate (CAGR) of 5.2% over the forecast period [2016-2024]" (Goldstein Market Intelligence, 2020). The US market alone, consumes 10 billion doughnuts a year (Green, 2018).

There is a snack food industry trend to sell miniature and or portion-controlled options and this serves as a strength for this concept (Choi, 2015). Consumers appear willing to pay more for indulgent treats in health and calorie conscious portions (Peters, 2007). Some market concerns include: "Rising health consciousness among the population living in urban cities" and "Availability of different types of bakery products" (Goldstein Market Intelligence, 2020). The market is very competitive with many well know national franchises as well as local niche shops.

COMPETITION

Competition must always be considered when deciding to start a new business. There are three main gourmet doughnut shops in Candy's community that would be direct competition, as well as franchised doughnuts shops and nearby grocery stores that sell doughnuts. We will focus on the three shops that offer gourmet doughnuts.

Retro Doughnuts offers gourmet yeast fried doughnuts but only offers black coffee with half and half as the coffee selection (Baird, 2017). They do have a drive thru and the doughnuts are premade, so service is quick.

Casual Friday Doughnuts offers gourmet yeast fried doughnuts as well as a full-service coffee selection (Casual Friday Doughnuts, n.d.). They have a drive thru, as well as seating for customers. Service is quick but the location makes it difficult for getting in and out of traffic. The third direct competitor is Hello Sugar. They offer gourmet miniature cake fried doughnuts as well as a full-service coffee selection (Hello Sugar, n.d.). These doughnuts are made to order so the wait time is considerably longer than the other doughnut shops. Hello Sugar does not have a drive thru but does have a nice dining area. However, it is in an inconvenient location.

TEACHING NOTES

DOUGHNUT STAND CASE STUDY

This Doughnut Case Study resolving the viability of Candy opening a mini doughnut shop was used in Fall 2020 as a replacement for the midterm exam. The class was taught online, so this was a way to test student's knowledge and cost application abilities without relying on existing exam problems. The project was assigned mid-way through the term so that students had enough knowledge to begin the analysis. The students had five weeks to complete the project as they continued through the course. They were required to work alone but could use their online book and notes.

One of our most important goals of designing a case study of this nature was to create a model where numbers can be easily changed, and the project used each quarter. There was no way for students to find the answers as this was a newly created problem. Their submission was based on no access to existing answers that could be found online.

The problems were designed to follow the structure of a basic cost accounting textbook and homework and were presented in the same order as they would find in their textbooks. The project problems are like the homework problems found in Pearson and McGraw Hill online portals except that the information needed to solve the problems is presented in the aggregate. Students were required to determine what information was needed to solve the individual comprehensive case study problems. In fact, the students were advised to use their homework portal as a reference on how to structure the problems since they were given no formats to which they could refer. The students had to apply the comprehensive data to create excel formats much like they will encounter in a job. Below is student feedback to the project as well as the results of the project.

STUDENTS COMMENTS

The following questions were posed to students after they submitted their project:

1. Would you prefer a project like this or a mid-term (not open book or open note)?
 - A. I feel this project, or a project like this, is a good way to illustrate how the topics we learned about in the book could be used in real world situations. Having worked most of my professional career in an accounting setting, my real-world knowledge has helped me more times than not when taking the accounting courses from (University).
 - B. While a mid-term is more traditional, this project was pretty well done in my opinion. I would always take something like this over a test. It felt very applicable and hit nearly every learning objective on the nose.
 - C. I would prefer a project like this because it really helped put all that you learned into practice, while a midterm you're just aiming for getting things right and in my opinion isn't as fun as a project.

- D. I really liked this project because it was a real example where I could apply the knowledge I learned. I appreciated that because I think it was more difficult than a mid-term but gave me a far better understanding of the material. Being able to see all different calculations and how they work together from beginning to end was invaluable in my opinion.
2. What was the hardest part about this project?
- A. Had you not included the online help questions I would not have known where to begin with the project. That was the biggest saving grace you could have offered. Also, not having immediate feedback like we have with our homework on whether the answer was correct or not, made things a little more difficult.
- B. The hardest part was probably the ABC costing part. I wasn't sure about the cost driver for revenue, and the whole problem in general took a lot of time. Not only that, but it was a lot of Algebra that could've gone wrong, and I also wasn't sure how much info and work needed to be shown.
- C. The hardest part about this project was probably remembering all the extra information that Candy had mentioned like for example on problem number 7 when we had to remember that Candy likes to make an extra 50 or so doughnuts just in case.
- D. The sheer size of it and being unsure about the proper formatting and what to include and what not to include. Without examples or smaller projects before to base it on it made me unsure about what the overall project needed to look like. I was constantly worried that if I messed up one piece the mistake would cascade down and ruin the whole thing. Since my project ended up being big (12 pages I think?) this made me the wariest. I was worried I missed something or included too much, or the format was completely off. This was not a huge problem as you were always more than happy to help look over my drafts. I really appreciated that!
3. What did you enjoy the least about the project?
- A. I least enjoyed feeling lost on some problems and not having anyone to compare my work with except for emailing you! You were always very helpful but I felt bad emailing you because I know you are busy with other students and home life as well! (I know I probably could have reached out to the other girls in office hours, but I get nervous)
- B. The last problem, the conclusion. Not because anything was wrong with it, just because it was the most challenging for me. Analyzing all the numbers, calculations, data and deciding a course of action based off them was difficult! It was an integral part of the project and really what sets it apart from a midterm because it truly applies the knowledge to a real-world scenario. That is what made it so difficult and honestly took me the longest out of any other part!

- C. I loved doing all the equations! Some of them were really challenging and I definitely got confused but I liked to be able to use excel (which is pretty realistic for when I get out of school) rather than just the homework lab. Also, the additional homework assignment you created was so very helpful for some of the more difficult problems. Just being able to see a slightly similar example was a game changer on the parts I got stuck on.
4. What did you enjoy the most about the project?
- A. I felt this project put the items we learned about in this class into prospective. I feel that learning the information and then sitting for a test doesn't necessarily teach students how to use the data. Even if business students are not going into accounting, knowing how to use the data in their future can only help them with long-term goals, especially if they are planning on starting a business.
- B. That there was a backstory and not just calculations that needed to be done but an actual occurring problem with a meaning behind it. It helps you understand what you're trying to calculate and for who and what. I also liked the amount of time that was given to complete it and that you helped with giving example problems on the homework. It was definitely something that you needed to put a lot of time and effort in.
- C. I loved doing all the equations! Some of them were really challenging and I definitely got confused but I liked to be able to use excel (which is pretty realistic for when I get out of school) rather than just the homework lab. Also, the additional homework assignment you created was so very helpful for some of the more difficult problems. Just being able to see a slightly similar example was a game changer on the parts I got stuck on.
5. Would formatted tables have helped you to be more effective and efficient?
- A. As you could see in my project, I like creating my own tables. However, I mostly followed the step-by-step instruction provided from the online help questions. I am not sure everyone knew that the program provides them with this helpful feature, but it has saved me many hours on my homework and helped me tremendously on this project.
- B. Formatted tables would have helped some, though I think what would help a lot more (and I don't know if this is what you are referring to) would be a set of blank tables and stencils provided to us to show work and answers. For example, for the revenue budget, the ABC Costing, and the overhead calculations, provide us with blank templates that could fit the necessary calculations and answers (especially for the revenue budget), almost similarly to the homework, though with no words or numbers (maybe a few, like "Cost of Goods Sold," or "Operating Income" for the budgets, just something as placeholders.) Formatted tables in the problems themselves would make the problem easier to read.
- C. Do you mean formatted tables that we enter our answers/calculations into? If so, then definitely! The uncertainty and worry of incorrect formatting or not including enough information tripped me up the most! I think this would also help to guide future students

in the right direction and maybe free up some of your time having to answer questions or provide more direction.

RESULTS

The average grade for the project was a 91%. The highest grade was a 95% and the lowest, a 79%. The greatest areas of struggle were concerning the calculations of contribution margins in a bundle of products and in activity-based costing. There was also some struggle with variance analysis. This is not surprising as there are multiple computations needed for these problems. As can be noted in the student comments, they struggled to find the correct information needed for the problems. The amount of informational data, not uncommon in real-world application, was at times overwhelming. The students noted that without referring to homework examples, they could not discern what data were needed to solve the different problems. If a professor wants to provide formatted tables to ease the onerous of the problems, that is a possible way to simplify the project.

CONCLUSION

In conclusion, the project was favored by the students over a mid-term exam. It exposed them to a real-world situation. It helped them to understand the complexity of looking at comprehensive data to determine the viability of a project or product. This project is easy to change a few numbers and create a new situation that cannot be found on the Internet to accurately assess student's knowledge and application abilities. Candy's Doughnut Shop is a viable alternative to a mid-term exam or a way to assess your student's knowledge of the concepts found in their textbooks.

Appendix I**Cost Data Needed for Your Problems**

The following tables include estimated revenue and costs. Based on competition in the area, one dozen doughnuts can be priced at \$8.50, the half dozen at \$6 and the doughnut pop at \$3 (Hello Sugar, n.d.). The contribution margins are shown below.

Contribution Margins:

	Full Dozen	Half Dozen	Doughnut Pop	Coffee
Revenue	\$8.50	\$6.00	\$3.00	\$5.00
Direct Materials	1.36	0.64	0.26	0.87
Variable Direct Labor	1.30	0.87	0.47	All labor is fixed
Total Variable Costs	<u>2.66</u>	<u>1.51</u>	<u>0.73</u>	<u>0.87</u>
Contribution Margin	<u>5.84</u>	<u>4.49</u>	<u>2.27</u>	<u>4.13</u>

* Coffee production labor is included as a fixed cost because staff will need to be paid for operating the stand regardless of how many coffees are made or sold.

Annual Revenue:

Average Customers Per Day	70
Average Spent Per Customer	× \$11.50
Average Revenue Per Day	<u>\$805</u>
Times 30-days	× 30
Average Monthly Revenue	<u>\$24,150</u>
Times 12 months	× 12
Average Annual Revenue	<u>\$289,800</u>

*Average 30-day month is used in the calculations

Annual Variable Costs:

	Units Costs	Variable daily costs	Variable monthly costs	Annual variable costs
Variable direct labor for doughnuts 5.5 hours to produce 55 dozen doughnuts	5.5			
Wage rate	× \$14			
Variable direct labor per day		\$77.00		
Variable direct materials per dozen doughnuts	\$1.36			
Average of 55 dozen produced per day	× 55			
Variable direct materials for doughnuts per day		74.80		
Variable direct materials for coffee	0.87			
Average of 70 cups produced per day	× 70			
Variable direct materials for coffee per day		<u>60.90</u>		

		<u>\$212.70</u>		
Times 30-days		× 30-day	\$6,381	
Variable average monthly utilities and maintenance			<u>450</u>	
			<u>\$6,831</u>	
Times 12 months			× 12 months	
Total annual variable costs				<u>\$81,972</u>

*The \$14 wage rate includes payroll taxes

*Daily demand for doughnuts is 50 dozen but Candy will produce 55 dozen per day to meet quality standards and ensure a variety of flavors are available.

Annual Fixed Costs:

Rent at \$1000 a month x 12 months	\$12,000
Insurance is \$25 a month x 12 months	300
Support labor and training is \$3,360 a month x 12 months (8 hours per day x 30 days x \$14)	40,320
Coffee Production labor is \$1,890 a month x 12 months (4.5 hours per day x 30 days x \$14)	<u>22,680</u>
Manager salary	<u>40,000</u>
Total Annual Fixed Costs	<u>\$115,300</u>

* Coffee production labor is included as a fixed cost because staff will need to be paid for operating the stand regardless of how many coffees are made or sold.

Annual Overhead:

Rent is \$1000 a month	\$12,000
Insurance is \$25 a month	300
Support labor and training is \$3,360 a month (8 hours per day x 30 days x \$14)	40,320
Utilities and maintenance are \$450 a month	<u>5,400</u>
Manager salary of \$3333 a month	<u>40,000</u>
Total annual overhead	<u>\$98,020</u>

Cost Analysis Exercises for This Project

1. CVP analysis (10 Points):

Candy would like a CVP analysis done with her estimated numbers.

Revenues	\$289,800
Fixed Cost	\$115,300
Variable Costs	\$81,972

Variable costs change based on how many dozen doughnuts are sold.

Compute the budgeted operating income for each of the following deviations from the original budget data. (Consider each case independently.)

Required:

1. A 10% increase in contribution margin, holding revenues constant
2. A 10% decrease in contribution margin, holding revenues constant
3. A 5% increase in fixed costs
4. A 5% decrease in fixed costs
5. A 5% increase in units sold
6. A 5% decrease in units sold
7. A 10% increase in fixed costs and a 10% increase in units sold
8. A 5% increase in fixed costs and a 5% decrease in variable costs
9. Which of these alternatives yields the highest budgeted operating income?
10. Explain why this is the case.

2. Contribution margin, gross margin, and margin of safety (10 Points):

Candy used her estimates to create an income statement for potential investors showing the monthly operating income.

Candy's Doughnuts		
Operating Income Statement - Monthly Estimate		
Units sold		<u>2,100</u>
Revenues		\$24,150
Cost of goods sold		
Variable manufacturing costs	\$6,381	
Fixed manufacturing costs	<u>1,890</u>	
Total cost of goods sold		<u>8,271</u>
Gross Margin		15,879
Operating Costs		
Variable utilities and maintenance costs	\$450	
Fixed operating costs	<u>7718</u>	
Total operating costs		8,168
Operating income		<u>\$7,711</u>

1. Recast the income statement to emphasize contribution margin.
2. Calculate the contribution margin percentage and breakeven point in units and revenues.
3. What is the margin of safety (in units)?
4. If sales were only 1,950 units and the tax rate is 21%, calculate its net income.

3. Sales mix, three products exercise (10 Points):

Candy offers three doughnut products, a full dozen, half dozen and the doughnut pop, with contribution margins of \$5.84, \$4.49, and \$2.27, respectively. She is estimating sales of 221,400 individual doughnuts in the coming period, consisting of 14,400 units of the full dozen, 7,200 units of the half dozen, and 5,400 of the doughnut pops. The estimated fixed costs for the period are \$92,620. Revenue and fixed production labor costs for coffee are ignored in this problem.

Required:

1. What is the company's breakeven point in individual doughnuts, assuming that the given sales mix is maintained?
2. If the sales mix is maintained, what is the total contribution margin when 232,200 doughnuts are sold? What is the operating income?
3. What would operating income be if the company sold, 9,600 units of the full dozen and 16,000 of the half dozen and 7,000 doughnut pops? What is the new breakeven point in units if these relationships persist in the next period?
4. Comparing the breakeven points in requirements 1 and 3, is it always better for a company to choose the sales mix that yields the lower breakeven point? Explain.

4. Budgeted manufacturing overhead rate, allocated manufacturing overhead (10 Points):

Candy plans on using normal costing. She allocates manufacturing overhead costs using a budgeted rate per labor-hour. The following are estimates for the period:

Budgeted Manufacturing Overhead Costs	\$98,020
Budgeted Labor Hours	6,480
Actual Manufacturing Overhead Costs	\$95,000
Actual Labor Hours	6,400

Required:

1. Calculate the budgeted manufacturing overhead rate.
2. Calculate the manufacturing overhead allocated for the period.
3. Calculate the amount of under- or overallocated manufacturing overhead. Why does Candy need to calculate this amount?

5. Job Costing (10 Points):

Candy has been asked by a couple to make 200 doughnuts as wedding favors. The couple will pay her \$500 for making, delivering and setting up the favors at the wedding location. The contribution margin of the doughnut pops is normally \$ 2.27. Should Candy accept this job or should?

Direct materials used	200 units	\$0.26
Direct labor hour	6 hours	\$14.00
Mileage	30 miles	0.60
Manufacturing overhead rate	Labor hours	\$15.13

Required:

1. Use job costing to calculate the costs for this job.
2. What is the total cost per unit?

6. ABC, process costing (10 Points):

Candy plans to produce coffee and doughnuts and estimates she will operate at capacity. Data related to the two products are presented here:

	Doughnuts (Full Dozen)	Coffee
Annual Production in Units	19,800 (55 per day x 30 days x 12 months)	25,200 (70 per day x 30 days x 12 months)
Direct Material Cost	\$26,928 (\$1.36 x 19,800)	\$21,924 (\$0.87 x 25,200)
Direct Manufacturing Labor Costs	\$27,720 (1980 hr. x \$14 an hr.)	\$22,680 (1620 hr. x \$14 an hr.)
Direct Manufacturing Labor-hours	1980 (5.5 hr. a day x 30 days x 12 months)	1620 (4.5 hr. a day x 30 days x 12 months)
Machine-hours	1080 (3 hr. a day x 30 days x 12 months)	1620 (4.5 hr. a day x 30 days x 12 months)

Total manufacturing overhead costs are as follows:

Rent & Insurance	\$12,300
Support Labor & Training	\$40,320
Maintenance & Utilities	\$5,400
Manager Salary	\$40,000

Required

1. Choose a cost driver for each overhead cost pool and calculate the manufacturing overhead cost per unit for each product.
2. Compute the manufacturing cost per unit for each product.
3. How might Candy use the new cost information from the activity-based costing system to better manage her business?

7. Revenue and production budgets (20 Points):

Candy would like revenue and production projection budgets for the coming period. The following information is available.

Projected Sales:

Product	Units	Price
Doughnuts (Full Dozen)	18,000	\$8.50
Coffee	25,200	\$5.00

The following direct materials are used in the two products:

Direct Materials	Unit	Doughnuts	Coffee	Purchase price per unit	Target Inventory
Batter Mix	Cups	1	0	\$0.45	1,200
Flavors	Ounces	0.25	1	0.20	1,500
Icing	Ounces	2	0	0.21	2,050
Coffee Beans	Ounces	0	0.2	0.52	240

*There are no units in beginning inventory for any materials.

Projected direct manufacturing labor requirements and rates are:

Product	Hours per unit	Rate per hour
Doughnuts	0.10	\$14
Coffee	0.05	\$14

Manufacturing overhead is allocated at the rate of \$15.13 per direct manufacturing labor-hour.

Required:

Based on the preceding projections and budget requirements for doughnuts and coffee, prepare the following prediction budgets:

1. Revenue's budget (in dollars)
2. Production budget (in units)
3. Direct material purchases budget (in quantities)
4. Direct material purchases budget (in dollars)
5. Direct manufacturing labor budget (in dollars)
8. Price and efficiency variances (10 Points):

For the coming period Candy has budgeted to purchase and use 41,650 ounces of icing at \$0.21 an ounce. She budgeted for 19,800 full dozen doughnuts to be iced. If actual purchases and usage were 43,000 ounces at \$0.19 an ounce and output was 20,000 full dozen iced doughnuts, what would the variances be?

Required:

1. Compute the flexible-budget variance.
2. Compute the price and efficiency variances.
3. Comment on the results for requirements 1 and 2 and provide a possible explanation for them.

9. Conclusion (10 Points)

Now that Candy has information from the cost analysis, the 5-step decision making process can be used to recommend a decision. Please answer each of these using an analysis of your findings in the previous problems

1. Identify problems and uncertainties
2. Obtain information
3. Make predictions about the future
4. Make decisions by choosing among alternatives
5. Implement the decision evaluate the performance and learn

Appendix 2**Cost Accounting Case Study: Answer Guide**

CVP Analysis

	Revenue	Variable Cost	Contribution Margin	Fixed Cost	Budgeted Operating Income
Original (Bold= Given)	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 115,300.00	\$ 92,528.00
1. A 10% increase in contribution margin, holding revenues constant	\$ 289,800.00	\$ 61,189.20	\$ 228,610.80	\$ 115,300.00	\$113,310.80
2. A 10% decrease in contribution margin, holding revenues constant	\$ 289,800.00	\$ 102,754.80	\$ 187,045.20	\$ 115,300.00	\$ 71,745.20
3. A 5% increase in fixed costs	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 121,065.00	\$ 86,763.00
4. A 5% decrease in fixed costs	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 109,535.00	\$ 98,293.00
5. A 5% increase in units sold	\$ 304,290.00	\$ 86,070.60	\$ 218,219.40	\$ 115,300.00	\$102,919.40
6. A 5% decrease in units sold	\$ 275,310.00	\$ 77,873.40	\$ 197,436.60	\$ 115,300.00	\$ 82,136.60
7. A 10% increase in fixed costs and a 10% increase in units sold	\$ 318,780.00	\$ 90,169.20	\$ 228,610.80	\$ 126,830.00	\$101,780.80
8. A 5% increase in fixed costs and a 5% decrease in variable costs	\$ 289,800.00	\$ 77,873.40	\$ 211,926.60	\$ 121,065.00	\$ 90,861.60

9. Which of these alternatives yields the highest budgeted operating income?

Option 1, A 10% increase in contribution margin, holding revenues constant, yields the highest budgeted operating income of \$113,310.80 which is a full \$10,391.40 over the next highest calculation

10. Explain why this is the case.

In this scenario we can maintain revenues while increasing our contribution margin which means our variable costs have decreased. Typically, an increase in units sold also increases variable costs. This cause and effect relationship is why the rest of the scenarios yield a much lower operating income.

Contribution Margin, Gross Margin, and Margin of Safety

1. Recast the income statement to emphasize contribution margin.

Candy's Doughnuts		
Monthly Operating Income Statement - Contribution Format		
Units Sold		2100
Revenues		\$ 24,150.00
Variable Costs		
Variable Manufacturing Costs	\$ 6,381.00	
Variable Maintenance Costs	\$ 450.00	
	Total Variable Costs	<u>\$ 6,831.00</u>
	Contribution Margin	<u>\$17,319.00</u>
Fixed Costs		
Fixed Manufacturing Costs	\$1,890.00	
Fixed Operating Costs	\$7,718.00	
	Total Fixed Costs	<u>\$ 9,608.00</u>
Operating Income		<u>\$ 7,711.00</u>

2. Calculate the contribution margin percentage and breakeven point in units and revenues.

Contribution Margin Percentage:

CM	\$ 17,319.00
Revenue	\$ 24,150.00
CM %	71.71%

Breakeven Point in Units:

CM	\$17,319.00
Units	2100
CM per Unit	\$8.25
Fixed Cost	\$9,608.00
CM per Unit	\$8.25
Breakeven Units	1165

Breakeven Point in Revenue:

Revenue	\$ 24,150.00
Units	2100
Selling Price	\$ 11.50
Breakeven Units	1165
Selling Price	\$ 11.50
Breakeven Revenue	\$ 13,397.50

3. What is the margin of safety (in units)?

Actual Sales	2100
Breakeven Units	1165
Margin of safety Units	935

4. If sales were only 1,950 units and the tax rate is 21%, calculate its net income.

Units Sold (given)	1950
Revenue (SP \$11.50*units)	\$ 22,425.00
CM (units *CM per unit \$8.25)	\$ 16,087.50
Fixed Cost	\$ 9,608.00
Operating Income	\$ 6,479.50
Taxes (21% given)	\$ 1,360.70
Net Income	\$ 5,118.81

Sales Mix, Three Products Exercise

1. What is the company's breakeven point in individual doughnuts, assuming that the given sales mix is maintained?

Sales Mix					
Products	CM per unit	Estimated Sales	Individual doughnut	CM	Period Fixed Costs
Dozen	\$ 5.84	14400	172800	\$ 84,096.00	
1/2 Dozen	\$ 4.49	7200	43200	\$ 32,328.00	
Doughnut Pop	\$ 2.27	5400	16200	\$ 12,258.00	
Total			232200		\$ 92,620.00
for ever dozen sold : .5 1/2 dozen sold : .38 pops sold					
14400/14400=1	1*5.84	\$ 5.84			
7200/14400=.5	.5*4.49	\$ 2.25			
5400/14400=.38	.38*2.27	\$ 0.86			
	Bundle CM	\$ 8.95			
Fixed Cost	\$ 92,620.00				
CM per bundle	\$ 8.95				
Breakeven Bundles	10349				
units per bundle					
Dozen	10349	124188			
1/2 dozen	5174	31056			
Doughnut	3932	11797			
Total Sold	19456	167041			
Breakeven Point in Individual Doughnuts:		167041			

2. If the sales mix is maintained, what is the total contribution margin when 232,200 doughnuts are sold? What is the operating income?

	Mix Units	Mix Individual	%	CM per unit	CM total
Dozen	14400	172800	74%	\$ 5.84	\$ 84,096.00
1/2 Dozen	7200	43200	19%	\$ 4.49	\$ 32,328.00
Doughnut Pop	5400	16200	7%	\$ 2.27	\$ 12,258.00
Total	27000	232200	100%	\$ 12.60	\$ 128,682.00
Total CM	\$ 128,682.00				
Fixed Cost	\$ 92,620.00				
Operating Income	\$ 36,062.00				

3. What would operating income be if the company sold, 9,600 units of the full dozen and 16,000 of the half dozen and 7,000 doughnut pops? What is the new breakeven point in units if these relationships persist in the next period?

	Mix Units	Mix Individual	%	CM per unit	CM total
Dozen	9600	115200	50%	\$ 5.84	\$ 56,064.00
1/2 Dozen	16000	96000	41%	\$ 4.49	\$ 71,840.00
Doughnut Pop	7000	21000	9%	\$ 2.27	\$ 15,890.00
Total	32600	232200	100%	\$ 12.60	\$ 143,794.00

Total CM	\$ 143,794.00
Fixed Cost	\$ 92,620.00
Operating Income	\$ 51,174.00

Sales Mix					
Products	CM per unit	Estimated S	Individual	CM	Fixed Costs
Dozen	\$ 5.84	9600	115200	\$ 56,064.00	
1/2 Dozen	\$ 4.49	16000	96000	\$ 71,840.00	
Doughnut Pop	\$ 2.27	7000	21000	\$ 15,890.00	
Total			232200	\$ 143,794.00	\$ 92,620.00

for ever dozen sold : .5 1/2 dozen sold : .38 pops sold		
9600/9600=1	1*5.84	\$ 5.84
16000/9600=1.69	1.69*4.49	\$ 7.63
7000/9600=.73	.73*2.27	\$ 1.66
	Bundle CM	\$ 15.13

Fixed Cost	\$ 92,620.00
CM per bundle	\$ 15.13
Breakeven Bundles	6175

	units per bundle	
Dozen	6175	74096
1/2 dozen	10312	61870
Doughnut	4508	13523
Total Sold	20994	149489

Breakeven Point in Individual Dough 149489

4. Comparing the breakeven points in requirements 1 and 3, is it always better for a company to choose the sales mix that yields the lower breakeven point? Explain.

No, only considering the mix that yields the lowest breakeven point ignores customer demand for the products. By considering demand of various products and basing the sales mix off that the company can best maximize profit.

Budgeted manufacturing overhead rate, allocated manufacturing overhead

1. Calculate the budgeted manufacturing overhead rate.

Budgeted Manufacturing Overhead	\$ 98,020.00
Budgeted Labor Hours	6480
Budgeted Manufacturing Overhead Rate	\$ 15.13

2. Calculate the manufacturing overhead allocated for the period.

Budget Manufacturing Overhead Rate	Actual Labor Hours	Manufacturing Overhead Allocated
\$ 15.13	6400	\$ 96,832.00

3. Calculate the amount of under- or overallocated manufacturing overhead. Why does Candy need to calculate this amount?

Actual Manufacturing Overhead Costs	\$ 95,000.00
Allocated Manufacturing Overhead Cos	\$ 96,832.00
Overallocated	\$ 1,832.00

Candy needs to calculate this because the allocation is based off estimates at the beginning of the period. The adjustments need to be reported because they affect the income used to evaluate performance.

Job Costing

1. Use job costing to calculate the costs for this job.

Direct Manufacturing Costs		
Direct Materials (200 * .26)	\$ 52.00	
Direct Labor (6 * 14)	\$ 84.00	
Mileage (30 * .6)	\$ 18.00	\$ 154.00
Manufacturing Overhead Cost (15.13 * 6 DLH)		90.78
Total Costs of Wedding Job		\$ 244.78

2. What is the total cost per unit?

Total Cost	244.78
Total Units	200
Cost Per Unit	1.22

ABC, process costing

1. Choose a cost driver for each overhead cost pool and calculate the manufacturing overhead cost per unit for each product.

Activity	Chosen Cost Driver	Rate	
Rent & Insurance	Units Produced	\$ 0.27	Per Unit Produced
Support Labor & Training	Labor Hours	\$ 11.20	Per Labor Hour
Maintainance & Utilities	Machine Hours	\$ 2.00	Per Machine Hour
Manager Salary	Labor Hours	\$ 11.11	Per Labor Hour
	Doughnuts		Coffee
Rent & Insurance Costs	\$ 5,346.00	\$	6,804.00
Support Labor & Training Costs	\$ 22,176.00	\$	18,144.00
Maintainance & Utilities Costs	\$ 2,160.00	\$	3,240.00
Manager Salary Costs	\$ 22,000.00	\$	17,998.20
Total Overhead Costs	\$ 51,682.00	\$	46,186.20
Divide by total Units Produced	19800.00		25200
Manufacturing Overhead cost per Unit	\$ 2.61	\$	1.83

2. Compute the manufacturing cost per unit for each product.

	Doughnuts		Coffee
Direct Materials Cost	\$ 26,928.00	\$	21,924.00
Divide by total Units Produced	19800		25200
Direct Material Cost per Unit	\$ 1.36	\$	0.87
Direct Labor Costs	\$ 27,720.00	\$	22,680.00
Divide by total Units Produced	19800		25200
Direct Labor Cost per Unit	\$ 1.40	\$	0.90
	Doughnuts		Coffee
Direct Material Per Unit	\$ 1.36	\$	0.87
Direct Labor Per Unit	\$ 1.40	\$	0.90
Manufacturing Overhead Per Unit	\$ 2.61	\$	1.83
Manufacturing Cost Per Unit	\$ 5.37	\$	3.60

3. How might Candy use the new cost information from the activity-based costing system to better manage her business?

Cost Information can be used to make decisions regarding planning and managing activities, product mix, cost reduction, process improvement, and designing.

Revenue and production budgets

1. Revenue's budget (in dollars)

Revenues Budget (In Dollars)			
	Units	SP	Total Revenues
Coffee	18000	\$ 8.50	\$ 153,000.00
Doughnut	25200	\$ 5.00	\$ 126,000.00
Total			\$ 279,000.00

2. Production budget (in units)

Production Budget (In Units)		
	Coffee	Doughnuts
Budgeted Unit Sales	18000	25200
Add Scrap	1800	0
Total Required Units	19800	25200
Deduct Beginning FG Inventory	0	0
Units of FG to be Produced	19800	25200

3. Direct material purchases budget (in quantities)

Direct Material Purchases Budget (In Units)				
	Batter Mix (Cups)	Flavors (Oz.)	Icing (Oz.)	Coffee Beans (Oz.)
To be used in Production	19800	4950	39600	5040
Add Target Ending Inventory	1200	1500	2050	240
Total Required DM	21000	6450	41650	5280
Deduct Beginning Inventory	0	0	0	0
Total DM Purchases (units)	21000	6450	41650	5280

4. Direct material purchases budget (in dollars)

Direct Material Purchase Budget (In Dollars)					
	Batter Mix	Flavors	Icing	Coffee Beans	Total
DM Purchases (units)	21000	6450	41650	5280	
Cost Per Unit	\$ 0.45	\$ 0.20	\$ 0.21	\$ 0.52	
Total DM Purchases (in Dollars)	\$ 9,450.00	\$ 1,290.00	\$ 8,746.50	\$ 2,745.60	\$ 22,232.10

5. Direct manufacturing labor budget (in dollars)

Direct manufacturing labor budget (in dollars)					
	Output Units Produced	DMLH per Unit	Total DMLH	Hourly Wage Rate	Total
Coffee	25200	0.05	1260.00	\$ 14.00	\$ 17,640.00
Doughnuts	19800	0.10	1980.00	\$ 14.00	\$ 27,720.00
Total					\$ 45,360.00

Price and efficiency variances

1. Compute the flexible-budget variance.

Actual Costs Incurred	Actual Input QTY*Budgeted Rate	Flexible Budget
8170	9030	8400
Flexible Budget Variance		
230 F		

2. Compute the price and efficiency variances.

Actual Costs Incurred	Actual Input QTY*Budgeted Rate	Flexible Budget
8170	9030	8400
Price Variance		Efficiency Variance
860 F		630 U

3. Comment on the results for requirements 1 and 2 and provide a possible explanation for them.

Candy has a favorable Price variance because the actual cost of Icing was less than she budgeted. She had an unfavorable efficiency variance because each dozen doughnuts to be iced used more icing that budgeted. She had a favorable Flexible Budget Variance overall because the price variance outweighed the efficiency variance.

Conclusion

1. Identify problems and uncertainties

What is the feasibility of opening a profitable drive thru gourmet mini doughnut and coffee stand?

2. Obtain information

Based on given cost and demand-established estimates our break-even revenue and units monthly is:

Breakeven Units	1165
Selling Price	\$ 11.50
Breakeven Revenue	\$ 13,397.50

This gives us a yearly breakeven revenue of \$160,770. Estimated yearly revenue and production (when factoring in scrap from daily demand for being 50 dozen but Candy producing 55 dozen per day to meet quality standards and ensure a variety of flavors are available) puts our revenue in the range of \$279,000.

Production Budget (In Units)			Revenues Budget (In Dollars)			
	Coffee	Doughnuts		Units	SP	Total Revenues
Budgeted Unit Sales	18000	25200	Coffee	18000	\$ 8.50	\$ 153,000.00
Add Scrap	1800	0	Doughnut	25200	\$ 5.00	\$ 126,000.00
Total Required Units	19800	25200	Total			\$ 279,000.00
Deduct Beginning FG Inventory	0	0				
Units of FG to be Produced	19800	25200				

3. Make predictions about the future

Based on these demand-established estimates from our break-even analysis and our CVP analysis we can see that Candy would be able to easily meet all minimum costs as well as make a profit even if demand were to decrease or costs to increase.

	Revenue	Variable Cost	Contribution Margin	Fixed Cost	Budgeted Operating Income
Original (Bold= Given)	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 115,300.00	\$ 92,528.00
1. A 10% increase in contribution margin, holding revenues constant	\$ 289,800.00	\$ 61,189.20	\$ 228,610.80	\$ 115,300.00	\$113,310.80
2. A 10% decrease in contribution margin, holding revenues constant	\$ 289,800.00	\$ 102,754.80	\$ 187,045.20	\$ 115,300.00	\$ 71,745.20
3. A 5% increase in fixed costs	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 121,065.00	\$ 86,763.00
4. A 5% decrease in fixed costs	\$ 289,800.00	\$ 81,972.00	\$ 207,828.00	\$ 109,535.00	\$ 98,293.00
5. A 5% increase in units sold	\$ 304,290.00	\$ 86,070.60	\$ 218,219.40	\$ 115,300.00	\$102,919.40
6. A 5% decrease in units sold	\$ 275,310.00	\$ 77,873.40	\$ 197,436.60	\$ 115,300.00	\$ 82,136.60
7. A 10% increase in fixed costs and a 10% increase in units sold	\$ 318,780.00	\$ 90,169.20	\$ 228,610.80	\$ 126,830.00	\$101,780.80
8. A 5% increase in fixed costs and a 5% decrease in variable costs	\$ 289,800.00	\$ 77,873.40	\$ 211,926.60	\$ 121,065.00	\$ 90,861.60

4. Make decisions by choosing among alternatives

Our CVP analysis shows Candy would maximize profits by decreasing her variable costs. If she were able to increase her contribution margin by 10% (ie decrease her variable costs by 25%) she could increase her Operating income by over \$20,000. This additional income could be used to open another location. Although our CVP analysis shows this, all our information, including our baseline, is based on estimates. Candy should maintain all costs and prices for the first year. She will be able to earn a good profit this way and in the following year be able to make a more realistic analysis to base changes or decisions on.

5. Implement the decision evaluate the performance and learn

Candy should open her business and spend the first year adhering to the prices and costs laid out in this Case Study. Costs should be measured and analyzed every month to compare budgets with actual performance. This case study should be treated as a benchmark and goal that she would compare to and aim for. Flexible budgets and variances should be prepared at the end of every month.

