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Sunrise Hotels: An integrated managerial accounting teaching case

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ABSTRACT

“Sunrise Hotels” consists of six, linked cases developed from a field study of a large hotel chain in North America. The cases are short, so they can be distributed and solved in less than a full class period, after a short lecture by the instructor. Students often see managerial topics as an unrelated collection of tools rather than as a coherent, integrated framework for decision-making and management control. Questions included with each short case guide students, and the integration developed across six cases in a single setting should help students view managerial accounting topics as inter-related tools for decision making and control.

1. Introduction

For many years, there have been numerous calls to develop more critical thinking and integrative learning in accounting education (AECC, 1990, 1992; Perspectives, 1989). More recent calls have come from both practitioners (AICPA, 2018) and accounting educators (Lehmann & Heagy, 2014; Springer & Borthick, 2007) as research has found that integrated learning improves critical thinking skills (Lin & Jou, 2013). To address these calls, we developed “Sunrise Hotels: An integrated managerial accounting teaching case” (hereafter, Sunrise Hotels), consisting of six linked cases developed from a field study of a large hotel chain in North America. The six cases, by linking multiple management accounting concepts, integrate topics such that students can more easily see the whole, rather than a series of unrelated topics. With integration, there is a greater opportunity for reflection leading to internalization of new knowledge (Hughes & Scholtz, 2015). Accordingly, knowledge is retained more easily, and the course becomes more valuable to students.

The six cases are short by design since the work is done in class, after a brief lecture. The richness of our data and setting allows students to bring the course to life, illustrating our topics with real-world problems rather than simple and unrealistic textbook problems. Students work in teams of three to five, assuming the role of general manager or analyst in the hotel. Working in small groups is better than working independently as students bring different perspectives and abilities to bear on problems that are not well-defined (Abrami, Lou, Chambers, Poulsen, & Spence, 2010; Springer, Stanne & Donovan, 1999). With the exception of the first case, we limited each case to one page to minimize the time spent reading the cases in class. The case is discussed once most teams have worked through it. Instructors wanting more data (locations, expense categories or years) can contact the case authors.¹

The setting is attractive for three reasons. First, accounting educators and students generally want more content related to service industries in order to add contextual variety to the managerial accounting course. Traditional managerial accounting textbooks tend

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¹ Additional cases are being prepared on the topics of capital budgeting and pricing.

Fig. 1. Linkages among the six cases.

to emphasize manufacturing. Second, many students have been to a hotel and can readily place themselves in the setting, enabling students to more easily grasp the concepts. Third, the setting offers a unified context for students to learn managerial accounting as a series of integrated concepts and methods.

2. Cases, sequencing and description of the research site

Fig. 1 shows the context of Sunrise Hotels as a pedagogical tool in a managerial accounting course. At the core of management accounting are models of cost functions using fixed and variable costs. Accordingly, cost estimation (Case A) is at the center of Fig. 1. A mixed cost model is the basis for the remaining cases: CVP analysis (Case B), relevant cost and benefits analysis (Case C), budgeting (Case D), variance analysis (Case E) and performance measures (Case F).² The latter two cases include information on investment and

² All cases are located in Appendices A–F, respectively.

operating results, respectively. Although we have taught the management accounting course topics in the (A), (B), ..., (F) sequence of cases, the cases can be rearranged by simply providing students with appropriate cost equations where necessary.

Students begin managerial accounting by learning about cost concepts. They need a cost equation to be able to conduct CVP analysis, prepare a budget and evaluate relevant costs. The recommended sequence of cases A to F mirror the sequence of our class. In teaching the class, we begin with a discussion of the concept of cost and then follow with coverage of cost estimation.

The Sunrise Hotels (A) case has 36 months of detailed sales volume and income statement data. The company has more than 200 line-items in its internal, property-level income statement, which we condense into a modest number of broader categories (e.g., front desk, housekeeping, utilities, supplies and maintenance) to make the students' analysis more manageable. The case asks students to identify the cost object (in the first case, it is the entire hotel) and the cost driver. As mentioned above, the simple nature of the setting makes the cost driver clear: rooms rented. While other factors, such as temperature, length of stay and guests per room impact total spending, these are all inconsequential relative to room-nights rented. These other factors are discussed in class and generally result in considerable debate about the nature of the relationship between cost and various possible cost drivers. Instructors in lower-level classes may skip much of these discussions to avoid complications.

Two examples—energy and water expenses—illustrate the cost driver discussions. For example, temperatures of unoccupied rooms are maintained at 60 degrees Fahrenheit (F) in the winter and 80 °F in the summer. This is done to minimize energy expense while ensuring guests have a comfortable guest experience.³ When a customer is booked into a room, most guests adjust the thermostat to their desired temperature. Accordingly, heating and cooling cost will be a mixed cost that is mostly fixed, but varies with occupancy, outside temperature and guest preferences. Thus, the instructor may discuss the implications of heating and cooling costs in this context. Water usage is an example of a cost object that is mostly variable (fixed costs are less than \$500/month) and with a modest r-square (only 33%). It is driven by occupancy, the average number of guests per room, seasons (highest during the summer), temperature and so forth.

After plotting the data (and addressing several unusual observations), students must estimate a cost equation. A technique is not suggested, since many instructors only teach the regression method of cost estimation. With the case requirement “open,” the instructor can either specify a preferred method, or let students pick a method if alternative techniques have been taught. Instructors who feel it necessary to teach cost estimation later in the course can simply provide students with a cost equation for the Sunrise (B) CVP case.

As mentioned above, the remaining cases can more easily be taught in different sequences (e.g., some instructors like to begin their course with performance measurement). The six cases highlight most of the topics taught in a first managerial accounting course: cost estimation, CVP analysis, relevant cost analysis, budgeting, variance analysis and performance measurement. Notably absent in this case setting is product costing. Students and instructors, however, often want more cases on service businesses. Indeed, many students will go on to work in service industries. The hospitality industry is the largest industry in the world in terms of employment.

3. Case objectives and implementation guidance

This section describes objectives and implementation guidance for each individual case. In each subsection we state the purpose of the case and provide suggestions for classroom use. For most of the cases we have provided additional follow-up questions; these questions could be discussed in class, time permitting, or as part of their assigned homework problems.

3.1. Sunrise Hotels (A)

This case illustrates cost estimation and is the first in a series of cases that integrates the various concepts using a setting most students are familiar with—a hotel. Cost estimation is taught at the beginning of the course and is the first case because estimates of fixed and variable costs are inputs into everything that follows.

This setting was chosen for its simplicity. Economy lodging hotels have a single output: rooms rented. There is only one type of room, no fitness or business center, no food and beverage services and no meeting space. Most of the concepts taught in an introductory managerial accounting class can be taught with this series of six cases. Students like the case because it is easy to grasp, it is realistic (the data come from a real hotel), gives the students an opportunity to improve their Excel skills and can be worked in class with no advance preparation.

The data comes from a hotel in the mid-western United States. Appendix G contains the data.⁴ The hotel is a two-level, exterior access, multiple-building property. Staffing is described in the case. One of the housekeepers is assigned to the laundry room where linens and towels are cleaned and pressed using in-house equipment. As pointed out in the case, GMs have a great deal of autonomy in running the hotel. Area managers visit the property at least once a month and managers are held to account for the property's financial performance. As the chief operating officer explained, the GM is often the difference between success and difficulty.

Employees are hourly non-union workers and, if the business is slow, some are not scheduled to work. Therefore, wages for most

³ In winter, for example, some hotels keep the room just above freezing so water pipes do not freeze. If a guest enters the room, it will take 30–45 min for the air temperature to reach a reasonably comfortable level. However, the bed will remain very cold throughout the night and the guest will wake up with a sore back! (This happened to one of the case authors, not far from the actual hotel in this case.)

⁴ Readers may also contact any of the authors for a file containing the data.

of the staff are variable. While it may appear that front desk staff would be fixed, the reality is that there is a variable part as staff may be added during peak hours. However, a good GM will cover the check-in process during peak periods. Wages are almost always at the minimum wage and there is high turnover ($> 100\%$). Training, as one might imagine, takes mere hours as most everyone knows how to make a bed, clean a toilet, etc. Front desk staff must learn how to run the computer systems and perform higher-level tasks, but still there is minimal formal training. What training is provided amounts to close supervision by the head housekeeper or GM in the first days of work.

Data is provided in a single Excel sheet containing 16 variables and 36 monthly observations. Along with two date variables, the fourteen variables are the total expenses for the major expense categories of the hotel: front office, housekeeping, other personnel (maintenance worker, benefits and taxes), etc. The case provides a description of each account.⁵ Solutions can be obtained from any of the manuscript authors.

3.1.1. Suggestions for classroom use

We have students work in class, in groups of two to four students. It is important that at least one student within each group have a computer with software capable of doing multiple regression. As most students have had an introductory statistics class, and most students have Excel installed, Excel is the tool most often used. We begin class by describing the setting and the data set. Since this case is worked in class, it is not a graded assignment and no grading rubric is needed.

In class, we provide students with 5–10 minutes to familiarize themselves with the data set. Total time spent on the case is 40–50 minutes. Instructors may wish to assign additional questions for follow-up. For example:

1. Identify other cost drivers for the hotel.
2. If the Sunrise Hotel were a full-service hotel (e.g., meeting space, food and beverage outlets, gift shop and business center), how might you approach cost estimation? Will simple regression be adequate?

3.2. Sunrise Hotels (B)

The B case illustrates cost-volume-profit (CVP) analysis. Students must estimate the selling price for next year, then adjust the cost equation estimated in the A case to compute unit contribution margin, breakeven, margin of safety and operating leverage. If the instructor wants to use this as a stand-alone case, a cost equation and pricing can be provided to the students. A limitation of this case is that it doesn't allow the instructor to compute breakeven for a multi-product setting.

3.2.1. Suggestions for classroom use

We have students work in class, in groups of two to four students. Since this case is worked in class, it is not a graded assignment and no grading rubric is needed. Some students may want to use Excel, but the case is quickly solved with pencil and paper. We provide them with 5–10 minutes to familiarize themselves with the data set. Total time spent on the case is 40–50 minutes.

Instructors who do not wish to assign the (A) case can simply provide students with the cost estimation equation. Instructors may wish to assign additional questions for follow-up. For example:

1. If Sunrise Hotels had a food and beverage outlet, how would you compute breakeven for the hotel? Assume you had the same fixed cost, but that the average meal price was \$12 with a variable cost of \$4 per meal. What additional assumption is required?
2. If the hotel were to experience a significant downturn (e.g., in the aftermath of 9/11 or in early 2009), how accurate do you think the CVP model would be?
3. What is the degree of operating leverage at breakeven?
4. When the firm is operating at a loss, the degree of operating leverage is negative. What does this mean?

3.3. Sunrise Hotels (C)

Relevant cost analysis is illustrated in the Sunrise Hotels (C) case by analyzing an outsourcing decision. While hotels have historically done their own laundry, a growing number of hotels have outsourced their laundry departments. Data for the analysis is given in the case handout. Students must identify relevant and irrelevant costs and possible relevant revenues.⁶

3.3.1. Suggestions for classroom use

Students work in class, in groups of 2–4 students. As this is a simple exercise, we allow them 15–20 minutes for analysis and 10–15 minutes for class discussion.

⁵ The company's data includes more than 200 accounts and data is available for 11 years. Accounts include travel, advertising, refunds, water, trash, etc. The full data set overwhelms an undergraduate student, but graduate and advanced undergraduate students have been given the full data set. Please contact one of the authors if you would like these data instead.

⁶ Some instructors may want to modify the case to include a wage increase brought on by a recently-enacted minimum wage law. Since most hotels pay \$7.50/hour, raising the minimum wage in steps to \$15.00/hour could provide some nice discussion in class (about timing of the outsourcing and what impact the wage shock might have on the supplier's [Washouse] price for laundry and the in-house labor cost, especially if the firms are in different cities with different wage laws).

3.4. Sunrise Hotels (D)

The (D) case illustrates budgeting. Students prepare an operating budget for 2017 using either a linear regression or industrial engineering model. In the Sunrise (A) case, students used multiple regression to estimate a cost equation for the entire hotel. In this case students are given four regression models to estimate cost estimates for four categories of hotel cost. The remaining accounts are provided in the spreadsheet template (as explained in footnote 2 in the [D] case). Since this is an in-class exercise rather than a homework assignment, we have the students work on a few accounts. Students use the two cost estimates (regression and industrial engineering) to prepare two operating budgets and a monthly purchases budget.

3.4.1. Suggestions for classroom use

Students work in class, in groups of 2–4 students. We allow 30–45 minutes for students to work out the budget and 10–15 minutes for a brief discussion.

We point out that the firm has significant errors in numerous accounts due to bookkeeping errors. For example, one can readily find negative amounts in for labor expense, electric expense, etc. When a clerk codes the wrong property and a GM notices the error, accounting reverses the error in a later period. A financial accountant isn't worried because the annual total is correct; however, data must now be carefully cleaned when used to support managerial decision-making.

In this case, the annual forecasted income for both methods are remarkably close. At other properties the numbers can differ markedly. The industrial engineering estimates were derived by one the case authors on the basis of interviews with several senior vice presidents and site visits at more than thirty properties. Instructors may wish to assign the questions below for follow-up:

1. Some GMs prepare their budgets (i.e., a bottom-up approach), whereas others are assigned a budget by their supervisor (i.e., top-down). What are the benefits and costs of each approach?
2. Should the organization use a single approach to budget preparation?

3.5. Sunrise Hotels (E)

Variance analysis is the subject of the Sunrise Hotels (E) mini-case. Students are given the actual income statement for the hotel they budgeted for in the (D) case. By comparing the actual results to budgeted figures, students see how the budget process is a critical part of effective management control. Market data was obtained from an organization that collects sales data from 98% of hotels in the marketplace, providing us with the ability to compute not only internal variances, but market size and market share variances.

To keep computations straightforward, and to enable students to work on this in class, the focus is on computing variances for an entire year. We explain to students that variance analysis should be done regularly at the operational level, but that the analysis done in this case is useful for management when seeking to evaluate a business unit's or manager's performance throughout the year.

3.5.1. Suggestions for classroom use

Students work this exercise, like the others, in groups. Since students seem to struggle the most with variance analysis, we provide them additional time to work on this case. They work on the case from 45–60 minutes and we provide 15–20 minutes for class discussion. If there is not much time in class, some professors may want to have students work on the variances outside of class, and discuss the solutions the following class session. Instructors who want to assign Sunrise Hotels (E) as a standalone case can simply provide students with a completed budget.

Students seem to struggle most with the price and efficiency variances (Level-3). A common mistake is to use the static budget quantity rather than the flexible budget quantity. We point out that, in the absence of inventory (where we would have differences due to early and late isolation of variances), the two Level-3 variances must sum up to the Level-2 variance.

3.6. Sunrise Hotels (F)

In this case students are introduced to performance measurement. Students are asked to compute the three measures from the Dupont formula (ROS, TAT, ROA), residual income and economic value-added.

Return on investment, or in this case Return on Assets (ROA), is defined as *net operating income*, which is income before interest and taxes (i.e., EBIT = earnings before interest and taxes). The controllable profit is provided in the (E) case. To get net operating income, depreciation expense and the allocated corporate expense should be subtracted from controllable profit. ROI can be decomposed into two other performance measures: Return on sales (ROS) and total asset turnover (TAT). ROS is defined as net operating income divided by sales revenue. TAT is defined as sales revenue divided by average operating assets.

Residual income (RI) is income earned beyond the required return of the firm's operating assets. It is defined as $RI = \text{Net operating income} - (\text{Average operating assets} \times \text{Required rate of return})$. EVA is an adaptation of residual income and is defined as: $EVA = (\text{After-tax operating income} - ((\text{Total assets} - \text{Current liabilities}) \times \text{WACC}))$, where WACC is the weighted-average cost of capital.

3.6.1. Suggestions for classroom use

Students work this exercise in class, in small groups. As these are straightforward calculations, the case can be done in 15 minutes.

Table 1
Relation between integrative case use and course outcomes.

	Predicted Sign	Dependent variable	
		Reduced model Course grade	Full model Course grade
CASE	+	0.318 (3.50)	0.186** (2.32)
PRIOR	+		0.366*** (6.00)
Intercept	.	4.388 (66.25)	2.795*** (10.18)
F-test		12.26	26.03
R-squared		0.124	0.400
N		89	81

** $p < 0.05$.

*** $p < 0.01$.

Instructors may wish to assign additional questions for follow-up, such as:

1. The case questions are all financial performance measures. However, many firms now include non-financial measures. Further, the Balanced Scorecard (BSC) is widely adopted and incorporates measures from four different perspectives. What are the four perspectives of the BSC? Identify one or two measures for each of the four BSC perspectives.
2. Many believe that financial targets motivate, at best, short-term thinking or, at worst, motivate unethical or illegal behavior. Discuss some problems associated with using financial performance measures. That is, what sorts of dysfunctional behaviors occur in firms using financial performance targets?

4. Case Efficacy

To assess whether the case was effective, an experiment was conducted during one semester. Students in one randomly-assigned class section used the Sunrise Hotels integrated case (treatment group) whereas two other sections were not assigned the case, instead working more traditional end-of-chapter textbook problems (control group). The course grade was based on midterm and final examinations.⁷ Students were randomly assigned to classes by a central planning department. Students were not permitted to withdraw from classes. Furthermore, they did not attend other sections as instructors did not generally permit this practice due to class and room size constraints. Because of the curriculum structure and course scheduling patterns, it was also difficult to attend a class that was not part of the student's schedule as doing so would mean missing another class.

We regressed the weighted exam scores that determined the course score onto a dummy variable (CASE) indicating use of the case (equal to 1 for students in the treatment group and 0 for students in the control group). Table 1 provides the regression result. The coefficient, CASE is positive and significant ($b = 0.32$, $p < 0.01$), explaining 12.5% of the variance ($F[1, 87] = 12.26$, $p < 0.01$). For 90% of the students, we had course scores for a prior accounting course and we took the opportunity to add this measure as a control variable (PRIOR). In this second model, the two independent variables explain 40.0% of the variance ($F[2,78] = 25.35$, $p < 0.01$). Both CASE ($b = .19$, $p < 0.01$) and PRIOR ($b = 0.37$, $p < 0.01$) were positively associated with the course score.

In addition to the quantitative assessment, we distributed a survey questionnaire on the last class day, asking students to indicate the extent to which they agreed to the following statement: "Cost estimation, CVP, budgeting and variance analysis are all integrated concepts."⁸ With a 7-point Likert-type scale, a t -test was conducted to compare the difference in responses for students in the two groups. The difference in responses for those in the treatment group (mean = 5.71, $sd = 1.19$) and control group (mean = 5.53, $sd = 1.07$) was not significant ($t[49] = 0.535$, $p = 0.15$, 1-tail). However, while not statistically significant, the slightly higher mean for the treatment group could suggest the case helps students perceive the topics as integrated.

In terms of verbal feedback, students were highly satisfied with the cases and the general approach to integrating managerial accounting concepts. Students from prior semesters also indicated that the integrated case approach helped them remember the material long after taking the course. Overall, the evidence suggests that the case is effective.

5. Conclusion

Using six cases set in the hospitality industry, students analyze data and apply models that explicitly link topics typically covered in an introductory managerial accounting course. Evidence obtained from an experiment and student survey suggests that integrated learning using small groups results in improved learning outcomes and a better understanding of how topics relate. While the case

⁷ Homework problems, while available to students, were not part of the course grade.

⁸ At the time of the experiment, there was no mini-case related to relevant cost analysis.

was designed for an introductory undergraduate managerial accounting course, it has been successfully used in a core managerial accounting MBA class.

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Appendix A

Sunrise Hotels (A).

A.1. Case background and site description

You have been hired by the general manager (GM) of a budget hotel in Colorado. The hotel is part of a large economy lodging chain in North America. Economy lodging hotels include Super 8, Motel 6 and Days Inn. They are typically small, free-standing hotels with no food and beverage outlets (i.e., restaurants and bars), no conference or banquet facilities, no meeting spaces, and limited services. There is a single output: the provision of rooms for one or more nights. While there are “single” and “double” rooms, differences are minor so there is no need to use weighted-average prices or costs. With a single output, there is one obvious cost driver: the number of rooms rented.

An economy lodging “property” typically has 110 rooms, although size may range from 60 to 175 rooms. Rooms are basic and there are few amenities. Room access is typically from the building’s exterior. Like chain restaurants, economy lodging hotels develop standard properties to minimize construction costs.

A typical property is staffed by a GM, five front desk workers, five housekeepers, a head housekeeper, a laundry worker, and a maintenance worker. Wages for all hotel workers other than the GM are at or slightly above the minimum wage; this is the result of high employee turnover and low-skill positions. Recruiting and training costs for employees, other than the GM, are minimal.

The GM has a great deal of autonomy in running the day-to-day operations of the hotel. The GM is supervised by a district manager who typically oversees eight to fifteen properties, visiting each property every four to six weeks. GMs are responsible for pricing (with corporate oversight), local advertising, hiring and terminating hotel staff, selecting local suppliers for unique products or services (e.g., landscaping, snow removal and major repairs), purchasing and maintaining an inventory of standard products (e.g., soap, linens, coffee and cleaning supplies), and conducting sales calls with local businesses. GMs participate in the budgeting process, although the procedure varies somewhat depending on the district manager and the individual manager (i.e., some area managers prefer a top-down approach whereas others support a participative bottom-up approach).

GMs are evaluated using both financial and non-financial metrics. A modest bonus is awarded to GMs who achieve their profit goals for the year. Additional bonuses are awarded for achieving customer satisfaction and internal audit targets. A property’s financial targets for the bonus vary depending on local economic conditions and the physical condition of the assets. As with the budgeting process, the district manager may choose to negotiate the target with the GM or simply impose a target of her/his choosing. GMs who do not achieve a minimum, company-wide audit score (also the threshold for the bonus) for three years are to be terminated (despite this requirement, the chief financial officer could not remember this ever happening). The quality target is corporate-wide, but the specific figure depends on the property’s age (i.e., newer or renovated properties are held to a higher target than older, more run-down properties).

A.2. Estimating the hotel’s cost function

Next week is the Area Manager’s Meeting. Your GM wants to look good in front of her boss, the district managers and other general managers. To begin your analysis, you must estimate the hotel’s cost equation. The accounting department provided you with three years (2015–2017) of monthly data. These data consist of the following items:

Item	Description
Rooms available	A measure of capacity. Rooms out of service (for repairs) lower this measure.
Rooms rented	Number of rooms sold each month (i.e., sales volume)
Rooms revenues	Total revenues received for rooms rented.
Other revenues	Includes vending machines, Internet access, laundry, etc.
Total revenues	The sum of room revenues and other revenues.
Front office	Wages for the general manager and the front desk staff.
Housekeeping	Wages for housekeepers, housekeeper supervisor and laundry worker.
Other personnel	Wages for the maintenance worker, payroll taxes, benefits, etc.
Total personnel	The sum of front office, housekeeping and other personnel expenses.
Supplies	Expenses related to cleaning supplies, in-room amenities, coffee, etc.

Other expenses
Repairs
Energy
Other utilities

All expenses not otherwise classified (e.g., advertising)
Expenses related to paint, plumbing supplies, electrical supplies, etc.
Expenses for gas, electricity and water.
Expenses for trash pickup, cable television, telephone equipment, etc.

A.3. Required

1. Identify the cost object (i.e., the dependent, or y variable).
2. Identify the cost driver (i.e., the independent, or x variable).
3. Plot the data to assess whether a linear (mixed cost) model is appropriate. Are there any unusual data points that should be removed or transformed?
4. How much data should be used in the cost equation? Must you adjust for inflation?
5. Estimate the cost equation.
6. Evaluate the cost equation.

Appendix B

Sunrise Hotels (B).

B.1. Case background

January 2018. The GM has asked you to prepare a CVP analysis to aid in discussing next year's financial expectations at the upcoming Area Managers' Meeting. The meeting brings together 45 hotel managers and three district managers from the Southwest Region. From your managerial accounting class, you learned that break-even sales volume is computed using fixed costs and the unit contribution margin. Since you will be forecasting break-even for this year (2018), you need to make several adjustments to the three years of historical data you obtained. These adjustments are described as follows:

- **Price.** You examine the average selling price (i.e., average daily rate) for the past two years and decide that the hotel's room rate for next year will continue the same trend; in other words, you will realize the same percentage increase (or decrease) that was experienced in the past year. For example, if your rate increased 8% from 2016 to 2017, you will then forecast the 2018 room rate to be 8% above 2017's room rate.
- **Costs.** Your hotel's variable and fixed costs are obtained from the (A) case, in which you estimated the hotel's cost equation. After consultation with industry experts, you predict fixed costs will be the same next year. Further, you expect the variable cost per room-night to increase 4% due to inflation.

Based on your analysis of local market data, you believe that sales volumes will remain flat; that is, the number of rooms rented in 2018 will be unchanged from the 2017 sales volume.

B.2. Required

1. What are the assumptions of CVP analysis?
2. Compute the breakeven sales volume for 2018.
3. Calculate the margin of safety.
4. Determine the degree of operating leverage. What happens to leverage at different levels of planned sales volume? *Hint: Compute operating leverage at sales volumes of 50% and 120% of the 2018 planned sales volume.*
5. Draw a CVP plot and label the different attributes of the plot. Provide a brief interpretation of your figure.

Appendix C

Sunrise Hotels (C).

C.1. Case background

Recently a commercial laundry service, *The Washhouse Company*, approached you with an offer to clean and fold the hotel's linens and towels. *Washhouse* is an established laundry service that does laundry for area hospitals, restaurants, repair shops and a local gym. They will pick up and drop off laundry each weekday with next-day turnaround. The quoted price is \$0.32/pound. *Sunrise* will be billed weekly with payment terms at 7 days after receipt of invoice. Each rental generates 3.5 pounds of laundry.

Since its founding, all Sunrise Hotels did their own laundry. Each property has a commercial washing machine, dryer and folding machine. Recently you read an article in *Hotelier Monthly* that extolled the benefits of outsourcing achieved by many full-service hotels.

Your hotel has a washer, dryer, folder (iron) and water treatment equipment with a book value of \$25,500. Purchased 4 years ago, the equipment was estimated to have a useful life of ten (10) years. If you outsource the laundry, the equipment can be sold. The salvage value is \$4500.

Space for the laundry room in most properties is obtained by using two guest rooms at the rear of the property. If the laundry is outsourced, the laundry room can be converted to guest rooms. Conversion costs would be about \$30,000 for furnishings (bed, drapes, table, television, etc.), fixtures (lights, toilet, shower, etc.) and flooring. Rooms are remodeled every seven (7) years.

Laundry supplies (detergent, bleach, etc.) were estimated using a regression model for all cleaning supplies. You have determined that the variable cost is \$0.19/rental. Variable costs for laundry room water, gas and electric were estimated at \$0.12/rental. Reviewing financial and operational data you learn that repair costs averaged \$4725 annually over the past five years. The laundry department is supervised by the Head Housekeeper and 25% of her wages have been allocated to the laundry department. The head housekeeper is paid \$9.30 per hour and works full-time (2000 hours annually). The laundry worker is paid \$8.06 per hour. The laundry room can process 80 pounds of laundry per hour.

C.2. Required

1. Use the relevant cost framework to analyze the outsourcing decision if you expect 60% occupancy. What should you do?
2. Re-do the analysis with the assumption that occupancy remains the same next year.
3. What qualitative factors should be considered?

Appendix D

Sunrise Hotels (D).

D.1. Case background

January 2017. Previously, you estimated a cost function for the property and completed a CVP analysis. Your supervisor has asked you to prepare a 2018 operating budget. Analysis of historical data suggests the following monthly room demand:

Months	Monthly Demand
January and February	5% of annual demand.
March-May, September-October	8% of annual demand.
June-August	12% of annual demand.
November and December	7% of annual demand.

Revenues. In Sunrise (B), you forecast the average daily rate and sales volume for 2018. Assume the room rate is constant throughout the year.

Costs. Assume now that you ran regressions for each of the separate expense categories in your data file. Increasing the variable cost estimates by 4% (an assumption given in the B case) results in the cost formulas provided in the table below.⁹

Item	Cost Equation
Front desk	\$7800
Housekeeping	\$4.30/rental × Rentals
Supplies	\$1.35/rental × Rentals
Energy	\$4700

⁹ There are more than four accounts, but to make the exercise less tedious (and error prone), figures for the remaining accounts have been filled in on your spreadsheet. Further, two unusual observations are dropped.

An alternative to regression is the industrial engineering method of cost estimation. Your regional manager provides you with the following insights:

- The front desk is staffed twenty-four hours per day. Average wages of front desk staff are \$8.00/hour. Your annual salary, as general manager, is \$27,000.
- Housekeeping should clean a room in 20 minutes. However, preparing the laundry cart and taking linens to the laundry room mean that, on average, only two rooms per hour can be cleaned. The hourly wage rate for housekeepers is expected to be \$7.50. A laundry worker works 20 hours per week at \$7.50/hour.
- *Room Amenities.* Rooms are stocked with two bars of soap and a bottle of shampoo. Soap costs \$0.14 a bar and shampoo costs \$0.25 per bottle. At the beginning of each month, you want 25% of next month's requirements on hand. Beginning inventory requirements are met on January 1. Assume January 2018 room sales will be 900 rentals. *Other Supplies.* Paint, light bulbs, coffee, etc. average about \$1000 per month.

D.2. Required

1. Prepare a monthly operating budget for 2018. Explain why you chose the regression or industrial engineering method to estimate costs. What are the limitations of each method?
2. Prepare a monthly purchases budget for room amenities (units and amount).

Appendix E

Sunrise Hotels (E).

E.1. Case background

It is January 2019 and you are reviewing the 2018 income statement for your property. Next week, you and six other general managers will meet in El Paso, Texas with the regional manager for an annual performance review meeting. You gather the data provided below and use variance analysis to understand your results prior to the meeting.

Data from an industry consultant show that the market size in 2018 was 73,363 rooms, and you used this information in calculating your 2011 sales forecast (in Exercises 2 and 3). Today, in January 2019, market data revealed that 60,575 rooms were sold in your area by you and your competitors. Calculate actual (1) market share and (2) average room rate so that you may use these numbers to create flex budgets that enable you to report (1) market size and (2) market share variances.

Variances are computed relative to the budget. Use the budget you prepared in the Sunrise Hotels (D) case.

The following table was obtained from your year-end income statement:

Rooms Rented		15,713
Revenues		\$ 593,058
Controllable Costs		
Front Office	112,191	
Housekeeping	56,165	
Other Personnel	<u>79,594</u>	
Total Personnel		247,950
Supplies		20,601
Other Expense		28,792
Repairs		37,218
Energy		60,795
Utilities		<u>29,394</u>
Total Expense		<u>\$ 424,750</u>
Controllable Profit		\$ 168,308

E.2. Required

1. What are the Level-0, Level-1 and Level-2 variances for your property? What are the market size, market share and sales price variances? Hint: Prepare multiple flexible budgets, gradually relaxing assumptions from the static budget to the actual results (the “Turn-one-dial-at-a-time” approach).
2. What are the price and efficiency variances (i.e., Level-3 variances) for housekeeping expense? To do this, you obtained the following data from the company controller: Housekeepers worked a total of 7,247.1 hours. The standard (budgeted) wage rate was provided in the budgeting case, Sunrise Hotels (D).

Appendix F

Sunrise Hotels (F).

F.1. Case background

Mid-January 2019. To finish your presentation for next week’s meeting, evaluate your performance. To do this, you obtained the following supplemental data from the company controller:

Item	Amount
Allocated corporate expense	\$ 93,528
Depreciation expense	\$ 37,129
Interest expense	\$ 1395
Exceptional items	\$ 0
Average operating assets (total assets)	\$ 408,244
Average current liabilities	\$17,350

Your hotel’s controllable profit was provided in the Sunrise Hotels (E) case. The firm’s required rate of return is 8% and its weighted average cost of capital is 6%. Assume the corporate income tax rate is 30%.

F.2. Required

1. Compute your return on sales (ROS).
2. Compute total asset turnover (TAT).
3. Compute return on assets (ROA).
4. Compute residual income (RI) and economic value-added (EVA).

Appendix G

Capacity, Volume, Revenue and Personnel Data

Year	Mo.	Rooms Available	Rooms Rented	Rooms Revenue	Total Revenue	Front Office	House-keeping	Other Personnel	Total Personnel	Supplies	Other Expenses	Repairs	Energy	Other Utilities
2015	1	3162	1017	\$39,920	\$40,100	\$8823	\$3539	\$7880	\$20,242	\$268	\$4597	\$923	\$5269	\$720
2015	2	2958	823	\$29,777	\$30,142	\$8263	\$2979	\$5978	\$17,220	\$867	\$3119	\$1888	\$4676	\$2581
2015	3	3162	1393	\$52,099	\$52,343	\$8864	\$4781	\$7976	\$21,621	\$2031	\$2866	\$2085	\$4056	\$3294
2015	4	3060	1421	\$51,618	\$52,068	\$8452	\$4461	\$7014	\$19,927	\$2031	\$2866	\$2085	\$4056	\$3294
2015	5	3162	1594	\$64,288	\$64,943	\$7806	\$5294	\$8357	\$21,457	\$1486	\$2140	\$558	\$5934	\$1083
2015	6	3060	2040	\$87,321	\$88,190	\$8265	\$7222	\$6411	\$21,898	\$652	\$2711	\$2637	\$7473	\$5854
2015	7	3162	1984	\$101,024	\$102,420	\$9103	\$6772	\$6995	\$22,870	\$2327	\$4052	\$4938	\$6389	\$3107
2015	8	3162	1764	\$80,967	\$81,672	\$10,321	\$6076	\$4930	\$21,327	\$1908	\$3592	\$731	\$6315	(\$874)
2015	9	3060	1475	\$56,488	\$57,322	\$9282	\$5366	\$6803	\$21,451	\$620	\$1919	\$1421	\$7865	\$7396
2015	10	3162	1271	\$46,754	\$47,397	\$9845	\$4361	\$6348	\$20,554	\$1456	\$2305	\$2298	\$4019	\$3312
2015	11	3060	1012	\$37,747	\$38,303	\$6573	\$3212	\$6632	\$16,417	\$972	\$2730	\$711	\$2441	\$3075
2015	12	3162	1141	\$38,376	\$38,647	\$7325	\$3882	\$6871	\$18,078	\$1105	\$1296	\$1701	\$6408	\$2401
2016	1	3162	,922	\$34,426	\$34,767	\$9201	\$3774	\$6536	\$19,511	\$1089	\$2649	\$1323	\$5321	\$3182
2016	2	2856	896	\$32,728	\$33,592	\$6058	\$3283	\$6162	\$15,503	\$787	\$2647	\$1328	\$6659	(\$3949)
2016	3	3162	1189	\$42,630	\$42,966	\$8823	\$4303	\$8614	\$21,740	\$1232	\$3097	\$2077	\$6017	\$10,191
2016	4	3060	1234	\$40,373	\$40,947	\$8495	\$4117	\$4150	\$16,762	\$1108	\$2158	\$4800	\$6311	\$3523
2016	5	3162	1546	\$58,119	\$58,939	\$8942	\$5622	\$7387	\$21,951	\$2594	\$3034	\$2833	\$4441	(\$5875)
2016	6	3060	1871	\$74,540	\$75,467	\$9208	\$6982	\$8249	\$24,439	\$4525	\$2231	\$9088	\$1222	\$2241
2016	7	3162	2265	\$99,660	\$100,672	\$11,306	\$6909	\$8832	\$27,047	\$2929	\$6880	\$4380	\$9074	\$3119
2016	8	3162	2003	\$85,785	\$86,985	\$9159	\$8095	\$6675	\$23,929	\$2038	\$3062	\$350	\$5040	\$2238
2016	9	3060	1542	\$64,104	\$65,129	\$7353	\$5259	\$6878	\$19,490	\$1342	\$1425	\$7471	\$2352	\$2313
2016	10	3162	1194	\$48,663	\$49,033	\$8714	\$4624	\$4695	\$18,033	\$2116	\$1975	\$1010	\$5415	\$2378
2016	11	3060	915	\$36,997	\$37,501	\$8200	\$3461	\$7697	\$19,358	\$436	\$1399	\$499	\$5523	\$2420
2016	12	3162	900	\$37,519	\$38,024	\$8811	\$3009	\$4603	\$16,423	\$2818	(\$3224)	\$1037	\$5662	\$2464
2017	1	3162	719	\$27,762	\$28,225	\$8255	\$3083	\$6827	\$18,165	\$421	\$1836	\$2145	\$5121	\$1914
2017	2	2856	788	\$26,742	\$27,131	\$7390	\$2710	\$4774	\$14,874	\$1315	\$4563	\$1191	\$7513	\$2480
2017	3	3162	1367	\$43,897	\$44,669	\$9719	\$5601	\$5316	\$20,636	\$641	\$467	\$1836	\$8430	\$2395
2017	4	3060	1253	\$39,692	\$40,226	\$7916	\$4298	\$4963	\$17,177	\$1496	\$1800	\$1401	\$1641	\$2935
2017	5	3162	1644	\$54,763	\$55,625	\$9498	\$6513	\$6281	\$22,292	\$4095	\$2156	\$2710	\$4649	\$2046
2017	6	3060	2030	\$78,221	\$79,183	\$8792	\$7898	\$5562	\$22,252	\$1887	\$1822	\$3503	\$3307	\$2431
2017	7	3162	2572	\$105,477	\$106,789	\$12,624	\$12,189	\$6979	\$31,792	\$4633	\$3889	\$1387	\$6864	\$2876
2017	8	3162	2107	\$86,730	\$87,768	\$7830	\$9187	\$7998	\$25,015	\$2718	\$3092	\$3271	\$9173	\$2664
2017	9	3060	1722	\$70,093	\$70,803	\$6382	\$8634	\$7776	\$22,792	\$3103	\$1698	\$1639	\$4094	\$2931
2017	10	3162	1242	\$48,832	\$49,401	\$8153	\$5412	\$6945	\$20,510	\$1860	\$3750	\$1732	\$4118	\$2295
2017	11	3060	1095	\$42,596	\$43,480	\$9269	\$4443	\$7330	\$21,042	\$425	\$2513	\$952	\$5428	\$2786
2017	12	3162	1014	\$39,089	\$39,650	\$9066	\$4513	\$6410	\$19,989	\$1252	(\$2447)	\$4228	\$1399	\$1994

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