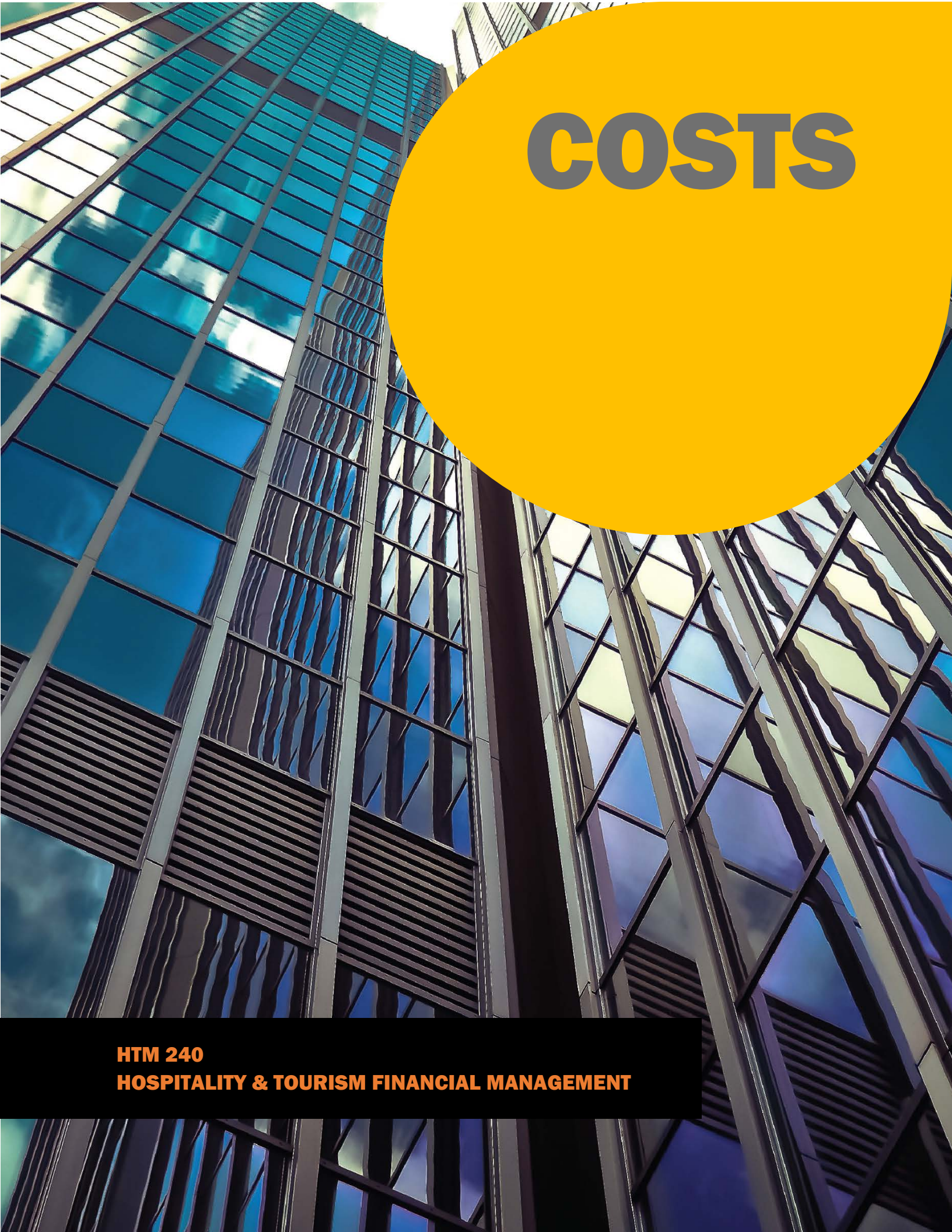


COSTS

HTM 240
HOSPITALITY & TOURISM FINANCIAL MANAGEMENT

CONTENTS

INTRODUCTION

In a previous lesson we introduced the income statement and expense analysis. In brief, the income statement reports revenues, expenses and profits. The relation of these three components to the income statement are summarized in the equation below:

Revenues - Expenses = Profit

We can rearrange the equation as follows:

Revenues = Expenses + Profit

Using this equation, we can say that at a given level of revenue, any decreases in costs lead to a proportionate increase in profits. Like other businesses, hospitality businesses are interested in increasing their profit. This is often performed by increasing revenues, but is also achieved through controlling expenses. In order to control expenses, we need to thoroughly understand them. In this lesson, we are going to expand our understanding of expenses. The terms expense and cost are often used interchangeably. Costs are what you spend to generate revenue. It is important to understand what drives costs in your business. There are a lot of ways we think about costs; we try to:

- Control costs
- Determine costs
- Cover costs
- Cut costs
- Measure increasing costs
- Eliminate costs
- Estimate costs
- Budget for costs
- Forecast costs
- Analyze costs

In the remainder of the lesson, we will look at various ways hospitality companies classify and analyze costs. This understanding is essential to effectively managing expenses.

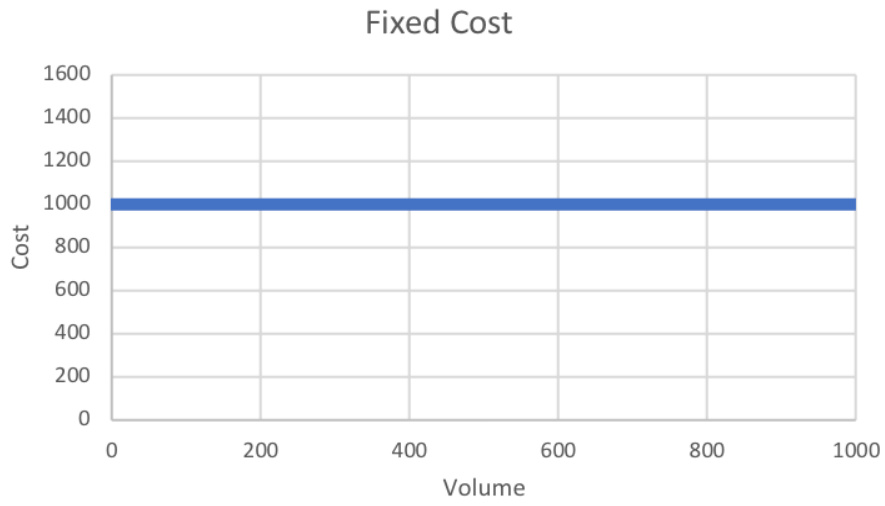
FIXED AND VARIABLE COSTS

Hospitality businesses typically experience periods of increased or decreased volume. Volume is a generic term that refers to the amount of guests, rooms, revenue or other revenue related metric that a business attains. Common volumes for restaurants include guests served, covers or revenue. For hotels, common volumes are rooms sold, occupancy, or revenue.

FIXED COSTS

When volumes change, some costs are impacted whereas other expenses seem to have no correlation with volume. When a cost is relatively constant and does not vary in direct relation to any volume, the cost is said to be fixed. Many fixed costs are constant and predictable, but costs don't need to be precisely constant to be fixed. Examples of fixed costs that are often

constant may include insurance expense, internet bandwidth expense, cable television expense and building depreciation. Just because a cost is fixed does not mean that the cost cannot change. Fixed costs are unlikely to change in the short-term but are frequently subject to change over time. For example, an internet bandwidth provider may increase its rates over time or a company may negotiate a lower rate with a different service provider. Some costs are not precisely constant, but may still be fixed. For example, a small restaurant may always need only one host. Such a small restaurant will never add a second host when it is busy. The host labor expense will not be constant though because hours worked from period to period will vary slightly. In this case the host labor is said to be fixed because it does not vary based on the number of guests served in the restaurant or based on the restaurant's sales. Below is a simplified graphical representation of a fixed cost.

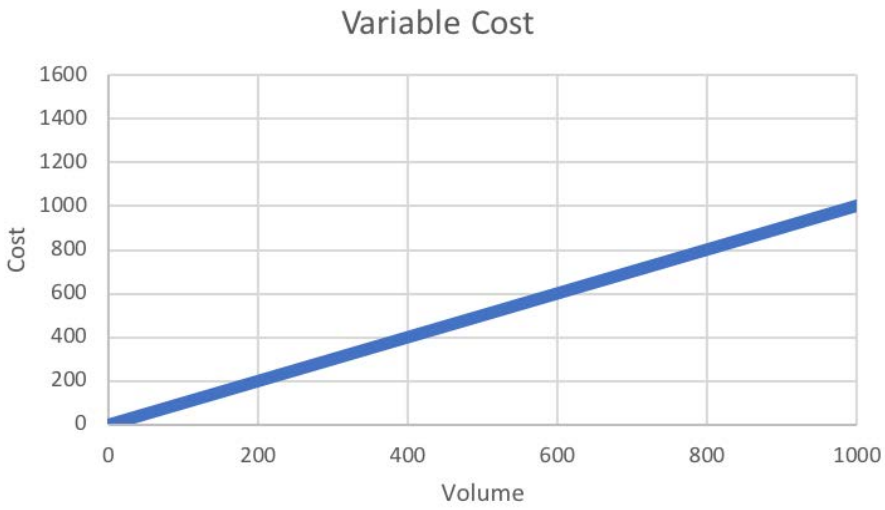


In the graph above, the blue line represents the amount of cost for each corresponding level of volume below. As you can see, the cost experiences not change as the volume increases.

VARIABLE COSTS

When a cost changes in direct relation to changes in volume the cost is said to be variable. For a cost to be purely variable, the cost is presumably zero when there is no volume. Often times, a costs may be viewed as completely variable even though the cost would unlikely be completely eliminated with no volume. In such cases the costs are said to be variable within a relevant range. Let's use an example to illustrate the point. Many hoteliers classify room attendant labor expense as purely variable. If an average room attendant is paid $12 per hour and is given 30 minutes to clean an average room, the expected cost per occupied room of room attendant labor is $6.00. A hotel may be able to maintain such a target cost per occupied room if they maintain occupancy levels in excess of 20%. Perhaps when a hotel operates below 20% occupancy the cost per occupied room rises. If the hotel sold only one room for the night, it may be unreasonable to expect only $6.00 in room attendant labor for the day. Similarly, if a hotel is frequently achieving elevated levels of occupancy, the use of over-time labor may be necessary, thus pushing the cost per occupied room above $6.00 due to the time and a half pay required for the overtime hours. Thus the relevant range for monthly room attendant labor

expense may be between 20% and 85% occupancy. Below is a graphical representation of a variable cost.



In the graph above, the blue line represents the amount of cost for each corresponding level of volume. As you can see, the costs increase at a steady rate as the volume increases and the cost is zero when the volume is zero.

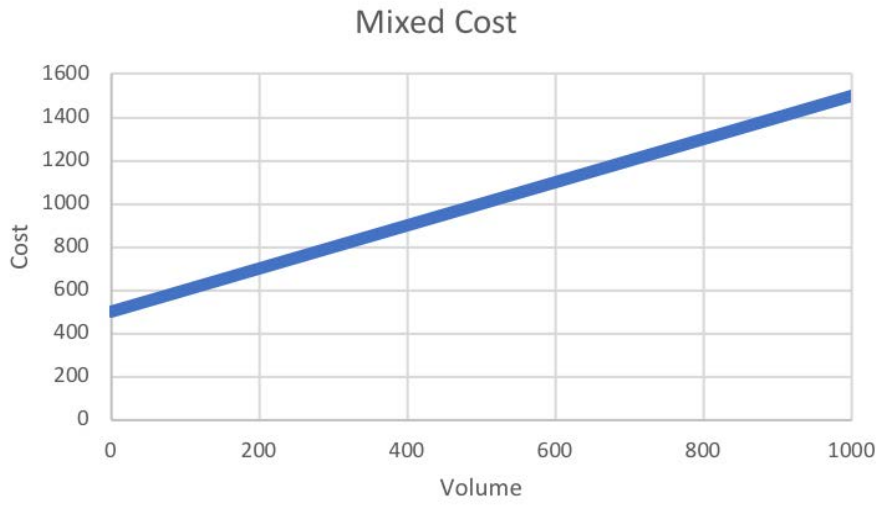
COST DRIVERS

Up to this point we have used the term volume to describe the revenue based metrics that influence variable costs. Accountants and managers often use the term cost driver in place of volume. This name is used because whatever the volume is, it drives the cost, or in other words, causes the cost to increase or decrease. Cost drivers are typically revenue related metrics. This is not always the case however. For example, a cost driver to natural gas expense may be the average temperature. As the average temperature drops, the amount of natural gas to heat a facility increases. In budgeting, cost driver volume is used to predict expenses. Many hospitality organizations also use cost driver volume to create performance targets used to evaluate a manager's effectiveness in controlling costs in an ever changing business environment.

MIXED COSTS

Some costs exhibit both fixed and variable attributes. These costs are said to be mixed or semi-variable. Mixed costs have a fixed expense present even when volume is zero, but then increase at a constant rate. Even though a cost is mixed, it may still have a relevant range as with purely variable costs. Many expenses are mixed. Let's use an example to illustrate how a mixed cost may work. Let's say there is a hotel near the equator that has a constant year round climate. The hotel would need a certain amount of water to maintain the landscaping and pools. As the occupancy level of the hotel increases, an increased amount of water is needed to provide for guest needs. In this case, there is a fixed amount of water needed to operate the hotel even when occupancy is at zero, and additional water is needed with each occupied room;

thus the cost is said to be mixed or semi-variable. Below is a graphical representation of a mixed cost.



In the graph above, the blue line represents the amount of cost for each corresponding level of volume. As you can see, when the volume is zero, there is $500 in cost. As the volume increases, the cost increases at a steady rate. Mixed costs can be represented by the equation of a line. The equation of a line is y = mx + b. Below we will identify each variable in the equation of a line as it relates to predicting total mixed cost.

$$Y = mx + b$$

Y = Total cost (the combination of both fixed and variable)

m = variable cost

x = driver volume

b = fixed cost

This equation can be used to create budget projections or determine standard costs. Standard costs are a measure of what a cost should be and will be discussed in greater length later in this lesson. Below is an example of how the equation above can be used to estimate a cost. Lets continue with our water example. Suppose that the hotel in the example above has a fixed water expense of $500 and that they incur an additional average water expense of $.50 per occupied room. Below we will estimate the amount of water expense needed when 5,000 rooms are occupied in a given month.

$$Y = mx + b$$

*Total Cost = variable cost * driver volume + fixed cost*

$3,000 = ($0.50 * 5,000) + $500

Thus, in order to accommodate 5,000 guests, an estimated water expense of $3,000 is needed.

SEPARATING FIXED AND VARIABLE COMPONENTS OF MIXED COST

Accountants and managers frequently wish to understand the breakdown of mixed costs into fixed and variable costs for budgeting, performance measurement and planning purposes. There are two common methods used to estimate the fixed and variable components of mixed costs; they are the high-low method and the trend line method. Mastering the skill of separating fixed and variable components of mixed costs is essential in this course. This skill will be required at various future points throughout this course.

HIGH-LOW METHOD

There are three steps in the high low method: first, determine the variable cost per unit for the mixed cost; second, determine the total variable cost portion of the mixed cost; and third, determine the fixed costs portion of the mixed cost. The high-low method name comes from the figures you use in the analysis. To perform the analysis, you compare the highest and lowest volume periods available within the timeframe you are evaluating. We will continue with the water expense from above. The following information is relevant to our analysis:

	Jan	Feb	Mar
Guests	4500	4000	5000
Water Expense	$2,800	$2,500	$3,000

In the example above, March is the highest volume month and February is the lowest volume month, thus information from these two months will be used in the analysis below.

1. To determine the variable cost per unit for the mixed cost, you divide the difference in cost by the difference in volume:

$$Variable\ Cost\ per\ Unit = \frac{High\ Cost - Low\ Cost}{High\ Volume - Low\ Volume}$$

$$\$0.50 = \frac{\$3{,}000 - \$2{,}500}{5{,}000 - 4{,}000}$$

2. To determine the total variable cost portion of the mixed cost you multiply the variable cost per unit calculated in step one by the number of units in either the high or low volume period. The period you select does not matter, but once you've chosen a period, you need to use the information from the same period in step 3.

$$Total\ Variable\ Cost = Variable\ Cost\ per\ Unit \times \#\ of\ Units$$

$$Total\ Variable\ Cost = \$0.50 \times 4{,}000$$

3. To determine the fixed costs portion of the mixed cost you take the total cost from the period you selected in step 2 and you subtract from it the total variable cost calculated in step 2.

$$Fixed\ Cost = Total\ Cost — Total\ Variable\ Cost$$

$$\$500 = \$2{,}500 — \$2{,}000$$

The Trend Line Method

To complete the trend line method, you will need a spreadsheet application; Microsoft Excel and Google Sheets both have this capability. Using the high-low method, only two data points can be used to estimate the fixed and variable components of a mixed cost. Generally, more data leads to better estimations. Spreadsheet applications make it easy to perform very complex analysis used to incorporate many data points into a single analysis.

The trend line method relies on a statistical tool called linear regression. In linear regression, a line is created through series of data points that best represents the data points. This line is found by finding the sum of least squares, or in common terms, the least amount of variation between a possible line and the data points. In short, the line used in trend line analysis is the best representation of the data points possible in a linear format. When performing trend line analysis, there are fields where you can select non-linear options such as exponential or polynomial. In this course, we will always use simple linear trend line analysis, which is the default in both Excel and Sheets.

When adding a trend line to a series of scatter plot points, it is essential that you display the equation on the chart. It is also valuable to display the R^2 value on the chart as well. The equation provides the fixed and variable components of mixed cost using the linear equation described earlier in the lesson ($y = mx + b$). The R^2 value is a measure of the trend line's representation of the data points. The lowest possible R^2 value is 0; the highest possible R^2 value is 1. An R^2 value near 0 means that the line really does not effectively represent the data. An R^2 value approaching 1 means that the line is a very good representation of the data. Having an R^2 value of one means that every data point is precisely along the trend line and that the trend line is a perfect representation of the data points.

When deciding which cost driver is most appropriate to use with a cost that has variable cost components, the cost driver that returns the highest R^2 value is typically the best choice. In the example below, revenue and covers are each evaluated to discover which is a better cost driver for linen expense.

Month	Revenue	Covers	Linen Expense
Jan	$274,944	10907	$2,057
Feb	$333,513	11532	$2,083
Mar	$336,501	12388	$2,209
Apr	$301,598	11486	$2,022
May	$207,587	10496	$1,883
Jun	$249,158	9619	$1,793
Jul	$144,323	8054	$1,453
Aug	$204,999	8428	$1,504
Sep	$234,964	8896	$1,622
Oct	$228,852	9566	$1,775

Nov	$267,196	9980	$1,807
Dec	$278,707	10448	$1,870

When trend line analysis was used to evaluate total revenue as a cost driver, the resulting R^2 value was .7815. When trend line analysis was used to evaluate total covers as a cost driver, the resulting R^2 value was .9727. Thus, because the R^2 value was higher when using total covers as a cost driver, total covers is likely a better means of estimating linen expense. Let's look at some more information found in each of these charts. Compare the grouping of data points around each trend line. Notice that the grouping around the trend line with total covers as the cost driver is much tighter? This is a reflection of the higher R^2 value. The trend line equation using total revenue as a cost driver estimated a fixed cost of $898 and a variable cost of $0.0037 per dollar of revenue. Whereas the trend line equation using total covers as a cost driver estimated a fixed cost of $70 and a variable cost of $.1744 per cover. Using different cost drivers can return significantly different results including different estimations of fixed cost.

DIRECT AND INDIRECT (OVERHEAD) COSTS

Another way of evaluating costs is whether they are direct or indirect. When a cost can be directly attributed to a single profit or cost center, the cost is said to be direct. Those costs that are shared between profit or costs centers are said to be indirect. Indirect costs are often referred to as overhead costs. In the hotel industry, the undistributed expenses and non-operating costs introduced earlier in this course would be considered indirect costs. Examples of indirect costs include: administrative salaries, rent, interest expense, utility expense and building depreciation.

ALLOCATION

In certain cases, overhead costs need to be allocated between various profit or cost centers or multiple properties. Allocation is the process of splitting up an amount and assigning the different amounts to various units. Allocations are commonly used in accounting. Below are some different examples of allocations:

- A regional sales manager's salary is split among the properties they oversee.

- Product costs from a shared inventory are split among the various profit centers that use the product.
- Tips for a banquet are split among the staff that worked the event.

There are many different methods for determining how much will be allocated to each unit. Sometimes, allocations are equal among the various units. More commonly, allocations are performed using based on some sort of volume or some predetermined standardized approach. Common basis for allocations include:

- Revenue
- Guests served
- Rooms occupied
- Room count
- Seat count

To calculate the amount being allocated to each unit, you use the following formula

$$Unit\ Allocation = \frac{Unit\ basis\ for\ allocation}{Total\ Basis\ for\ allocation} \times Total\ amount\ to\ be\ allocated$$

Let's say that a chain restaurant hires numerous regional managers to manage each of their locations. Each regional manager has 6 to 10 restaurants in their region. A particular regional manager has a salary of $135K per year. The company has decided that it will allocate the regional manager's salary to each restaurant based on the number of seats in each restaurant. Unit 451 has 160 seats while total seats in the region are 1277. Below is a calculation of the amount of the regional manager's salary to be allocated to Unit 451 based on the formula above:

$$\$16{,}915 = \frac{160}{1277} \times \$135{,}000$$

In the example above, allocation was performed based on the number of seats, the company could have allocated the salary equally across their 8 properties, or they could have based the allocation on annual guests, sales or other volumes. Below is an example of how the amount allocated might vary for each restaurant in the region based on the different basis for allocation listed above:

Regional Restaurant Manager Salary			**$135,000**
Restaurant	Seats	Annual Guests Served	Sales
Unit 451	160	74094	$824,642
Unit 873	232	111266	$1,485,592
Unit 1546	134	66940	$1,050,671
Unit 358	158	87067	$1,212,491
Unit 563	189	95285	$1,788,504
Unit 1298	132	66163	$965,365

Unit 645	101	44658	$703,414
Unit 912	171	86165	$1,234,008
Total	1277	631638	$9,264,687

Restaurant	Seats	Annual Guests Served	Sales	Equally
Unit 451	$16,915	$15,836	$12,016	$16,875
Unit 873	$24,526	$23,781	$21,647	$16,875
Unit 1546	$14,166	$14,307	$15,310	$16,875
Unit 358	$16,703	$18,609	$17,668	$16,875
Unit 563	$19,980	$20,365	$26,061	$16,875
Unit 1298	$13,955	$14,141	$14,067	$16,875
Unit 645	$10,677	$9,545	$10,250	$16,875
Unit 912	$18,078	$18,416	$17,981	$16,875
Total	$135,000	$135,000	$135,000	$135,000

As you can see, the use of different allocation basis can cause the amount allocated to each property to vary significantly.

OTHER COSTS

There are a variety of other types of analyzing costs that will be explored below.

CONTROLLABLE AND NON-CONTROLLABLE COSTS

Controllable costs are those that the manager has primary control over. Non-controllable costs cannot be changed in the short-term. Some of the most common examples of hospitality controllable costs are hourly labor, food cost, beverage cost, linen expense, and utilities. Some common examples of non-controllable costs include depreciation, rent, insurance expense, and taxes. It is useful to classify expenses as controllable or non-controllable because the manager should concern themselves primarily with the costs they have control over. Many companies have measures of profitability comprised only of accounts that the manager has control over. Such metrics are more appropriate when measuring performance.

STEP COSTS

Some costs remain constant within a certain range of volume then jump to a higher amount once the range of volume is exceeded. These types of costs are referred to as step costs. When looking at staffing levels on specific days, labor often increases in steps. For instance, a

single host may be adequate until a restaurant serves a certain number of guests, then a second host will need to be added. In this case the cost steps up to a higher amount after a certain amount of volume is reached. Something worth noting is that in the case of the hosts, the labor expense is unlikely to double. It is likely that a second host will only be needed for a couple of hours. In such cases, the restaurant would have the first host work from the beginning of the shift until the end of the busy period. The second host would come in just prior to the start of the busy period and would stay until the restaurant was closed. The amount of the overlap of the two hosts would likely increase as the restaurant volume increases, thus increasing the labor cost incrementally as additional guests are served. Eventually, it may be necessary to schedule a third or fourth host. When looking at specific shifts, labor often exhibits step cost results; when aggregating numerous shifts into a period, the labor is viewed more as a mixed cost.

INCREMENTAL COSTS

When evaluating costs, it is often valuable to know the cost of one additional unit. For hotels, this would be the cost of one additional occupied room. This can be insightful in determining applicable variable costs. We will build on this concept when evaluating contribution margin in the next lesson. So, let's think about what expenses would realistically increase by selling an additional hotel room. When thinking of incremental costs, we can split the costs of a hotel into three categories: those that would not increase with one additional guest, those that would increase, and those that may increase. Below is a table containing a description of items that fit into these three categories.

Incremental Costs

Would Not Likely Increase	Would Likely Increase	May Increase
Interest Expense	Franchise Fees	Front Desk Labor
Depreciation	Marketing Fund Fees	Houseperson Labor
GM Labor	Other Brand Related Fees	Property Maintenance Expense
Satellite TV Expense	Management Fee	Lobby Guest Supplies
Internet Bandwidth Expense	Room Attendant Labor	Reservation Expense
Landscaping Expense	Utilities	Commissions
Uniform Expense	In-Room Guest Supplies	Guest Transportation
Music and Entertainment Expense	Complimentary Breakfast Expense	Linen Expense
Management Cellular Phone Expense	Linen Laundering Expense	Laundry and Dry-Cleaning Expense
Online Ad	Credit Card Fees	Online Advertising
Real Estate Taxes	Cleaning Supplies	Sales Incentive Expense

Hotel incremental costs can vary quite a bit. The combined franchise, marketing fund, and other brand related fees can be as high as 17% of rooms revenue. Most management companies charge between 3% and 5%, credit card fees are typically just under 3%, and if rates are commissionable, commissions are frequently 10% of revenues. Added together these fees may be as high as 35% of revenues. Thus, in a luxurious resort selling its rooms for $600 per night, the incremental cost of a room may be $210 in just fees! On top of this, many operational and other costs may still need to be added. Thus, at a budget independent motel, incremental costs may be as low as $15 whereas the incremental cost of a franchised luxurious property may be in excess of $300 per night. You can see how understanding the incremental costs associated with your business helps you understand the minimum thresholds you would develop for pricing your product.

STANDARD COSTS

Standard costs are used to describe what a cost should be. Standard costs are often developed using standards and procedures. For example, restaurants develop recipes which serve as a basis for creating the standard cost of a menu item. Standard costs are important in managing hospitality businesses and making decisions. In the next lesson, we will discuss at great length how standard costs are determined for food and beverage menu items. Standard costs are also frequently used to evaluate labor performance and create budgets. For example, a hotel may have developed a standard amount of time it should take to clean due out and stay over rooms. If the standard time of due outs is 35 minutes and stay over rooms is 25 minutes, the hotel can use these times along with the average mix of stay over and due out rooms, and the average room attendant wage to develop a standard cost per occupied room for room attendant labor. Such a standard can be used to evaluate monthly room attendant labor expense and to determine budgeted room attendant expense for the upcoming year.

SUNK COSTS

Some costs have already been incurred and thus are no longer relevant to future decision making, these costs are called sunk costs. Let's say for example that a restaurant has purchased a dish machine to wash its dishes. If a dish machine chemical company approaches them about leasing a dishwasher, guaranteeing them that the amount they spend leasing the machine and using their chemicals will be less than the current cost of their chemicals, the depreciation of the old machine would not be factored into the decision. This is because the old machine was already purchased and whether or not they purchase the new machine will have no effect on the cost of the old machine. What would be relevant is the salvage value of the old machine, this would be considered a source of income and incentive to lease the new machine.

OPPORTUNITY COSTS

An important concept in evaluating costs are opportunity costs. An opportunity cost is something you give up in order to pursue a course of action. In investment terms, the cost of investing in something is the cost of foregoing another investment. Let's say for instance that a land owner is contemplating developing the land into a restaurant. The opportunity cost of developing the land into a restaurant is the best alternative use of the land. Maybe you could use the same land to build a convenience store. By building a restaurant, you are giving up all

the cash flows that would result from building a convenience store. Opportunity costs are not just used in investing; they are used in various forms of decision making as well. When hotels offer clients negotiated rates, the most significant consideration is how much alternative demand will we be turning away by negotiating a rate with a client, and how much would that alternative demand would have paid. In revenue management terms, the alternative demand we turn away by offering a negotiated rate is referred to as displaced business. The hope is that the benefit that the client provides us, in exchange for our offering them a negotiated rate, is in excess of the displaced business. In this case, the displaced business is a type of opportunity cost. Decisions where opportunity cost plays a factor are considered mutually exclusive, meaning you have to choose between two or more alternatives. In investing this is caused by limited real estate, capital or other resources. In revenue management, it is caused by limited room inventory.

There are many types of costs, by familiarizing yourself with the various ways costs are analyzed, you will be in a position to manage them better, measure and evaluate them better and make better decisions.