Frequently Used Formulas for Managing Operations

Chapter 1 - Hospitality Industry Accounting

Revenue – Expenses = Profit

Assets = Liabilities + Owners’ Equity

Chapter 2 - Accounting Fundamentals Review

Assets = Liabilities + Owners’ Equity

Variations of The Accounting Formula

Assets = Liabilities + Owners’ Equity
Assets - Liabilities = Owners’ Equity
Assets - Owners’ Equity = Liabilities

Assets = Liabilities
+ Permanent Owners’ Equity (Stocks + Retained Earnings)
+ Temporary Owners’ Equity (Revenue - Expenses)

Chapter 3 - The Income Statement

Revenue – Expenses = Profit

\[
\frac{\text{Money Earned on Funds Invested}}{\text{Funds Invested}} = \text{ROI}
\]

Food Costs (Food Cost of Sales) = Food Cost % for a Hotel

\[
\frac{\text{Food Costs}}{\text{Total Revenue}} = \text{Food Cost % for a Hotel}
\]

Food Costs = Food Cost % for a Restaurant

\[
\frac{\text{Food Costs}}{\text{Food Sales}}
\]

Net Income = Profit Margin

\[
\frac{\text{Net Income}}{\text{Total Sales}} = \text{Profit Margin}
\]

Specific Expense/Total Expenses = Specific Expense %

\[
\frac{\text{Sales This Year} - \text{Sales Last Year}}{\text{Sales Last Year}} = \text{Variance}
\]
(Sales This Year – Sales Last Year)/Sales Last Year = Percentage Variance
Variance/Sales Last Year = Percentage Variance
(Sales This Year/Sales Last Year) – 1 = Percentage Variance
Actual Expense – Budgeted Expense = Variance
(Actual Expense – Budgeted Expense)/Budgeted Expense = Percentage Variance
Variance/Budgeted Expense = Percentage Variance
(Actual Expense/Budgeted Expense) – 1 = Percentage Variance
Net Income This Year – Net Income Last Year = Variance
(Net Income This Year – Net Income Last Year)/Net Income Last Year = Percentage Variance
Variance/Net Income Last Year = Percentage Variance
(Net Income This Year/Net Income Last Year) – 1 = Percentage Variance

Chapter 4 - The Balance Sheet
Assets = Liabilities + Owner’s Equity
Money Earned on Funds Invested = ROI
Funds Invested
Cash This Year – Cash Last Year = Variance
(Cash This Year – Cash Last Year)/Cash Last Year = Percentage Variance
Variance/Cash Last Year = Percentage Variance
(Cash This Year/Cash Last Year) – 1 = Percentage Variance
Chapter 5 - The Statement of Cash Flows

Investing Activities This Year – Investing Activities Last Year = Variance

(Investing Activities This Year – Investing Activities Last Year)/Investing Activities Last Year = Percentage Variance

Variance/Investing Activities Last Year = Percentage Variance

Net Cash Provided from Operating Activities
Less Cash Used to Acquire Property and Equipment
Equals Free Cash Flow

Chapter 6 - Ratio Analysis

Two Cups of Water: One Cup of White Rice

Four Cups of Water: One Cup of Wild Rice

One Server: Ten Served Guests

One Server: Twenty Self-Serve Guests

Part = Percent
Whole

Current Assets = Current Ratio
Current Liabilities

Cash + Marketable Securities + Accounts Receivable = Quick (Acid-Test) Ratio
Current Liabilities

Current Assets – (Inventories + Prepaid Expenses) = Quick (Acid-Test) Ratio
Current Liabilities

Operating Cash Flows = Operating Cash Flows to Current Liabilities Ratio
Current Liabilities

Current Assets – Current Liabilities = Working Capital

Total Assets = Solvency Ratio
Total Liabilities
Total Liabilities = Debt to Equity Ratio
   Total Owners’ Equity

Total Liabilities = Debt to Assets Ratio
   Total Assets

Operating Cash Flows = Operating Cash Flows to Total Liabilities Ratio
   Total Liabilities

Earnings Before Interest and Taxes (EBIT) = Times Interest Earned Ratio
   Interest Expense

Cost of Food Consumed = Food Inventory Turnover Ratio
   Average Food Inventory*
   *(Beginning Food Inventory + Ending Food Inventory)/2

Cost of Beverage Consumed = Beverage Inventory Turnover Ratio
   Average Beverage Inventory*
   *(Beginning Beverage Inventory + Ending Beverage Inventory)/2

Total Revenue = Property and Equipment (Fixed Asset) Turnover Ratio
   Net Property and Equipment

Total Revenue = Total Asset Turnover Ratio
   Total Assets

Net Income = Profit Margin
   Total Revenue

Gross Operating Profit = Gross Operating Profit Margin (Operating Efficiency Ratio)
   Total Revenue

Net Income = Return on Assets Ratio
   Total Assets

Net Income = Return on Equity Ratio
   Total Owners’ Equity

Net Income = Earnings Per Share
   Total Number of Common Shares Outstanding

Market Price per Share = Price/Earnings (P/E) Ratio
   Earnings per Share
Dividend per Share = Dividend Payout Ratio
Earnings per Share

Dividend per Share = Dividend Yield Ratio
Market Price per Share

Rooms Sold = Occupancy %
Rooms Available for Sale

Total Rooms Revenue = Average Daily Rate (ADR)
Total Number of Rooms Sold

Occupancy% X ADR = RevPAR

Total Rooms Revenue = Revenue Per Available Room (RevPAR)
Rooms Available for Sale

Total Revenue from Hotel Guests = RevPAC
Total Number of Guests

Cost Under Examination = Cost per Occupied Room
Rooms Occupied

Beginning Inventory
+ Purchases
= Food Available for Sale
- Ending Inventory
= Cost of Food Consumed
- Employee Meals
= Cost of Food Sold

Beginning Inventory
+ Purchases
= Food Available for Sale
- Ending Inventory
= Cost of Food Consumed
- Value of Transfers Out
+ Value of Transfers In
- Employee Meals
= Cost of Food Sold
Beginning Inventory + Purchases = Beverage Available for Sale - Ending Inventory = Cost of Beverage Sold

Beginning Inventory + Purchases = Beverage Available for Sale - Ending Inventory - Value of Transfers Out + Value of Transfers In = Cost of Beverage Sold

Cost of Food Sold = Food Cost %
Food Sales

Cost of Beverages Sold = Beverage Cost %
Beverage Sales

Cost of Labor = Labor Cost %
Total Sales

Total Sales = Average Sales per Guest (Check Average)
Number of Guests Served

Covers Served = Seat Turnover
Number of Seats X Number of Operating Days in Period

Chapter 7 - Food and Beverage Pricing

Revenue - Expense = Profit

Price x Number Sold = Total Revenue

Current Number Sold X Current Price = Current Revenue

Current Revenue = Number that must be Sold
New Price

Cost of Food Sold = Food Cost %
Food Sales
Item Food Cost = Item Food Cost %
Selling Price

Item Food Cost = Selling Price
Item Food Cost %

1.00 = Pricing Factor
Desired Item Food Cost %

Pricing Factor x Item Food Cost = Selling Price

Selling Price – Item Food Cost = Item Contribution Margin

Item Food Cost + Desired Item Contribution Margin = Selling Price

# Sold x Item Food Cost = Total Food Cost

# Sold x Item Contribution Margin = Total Contribution Margin

Total Sales = Average Total Sales
Number of Menu Items

Average Total Sales = Weighted Average Selling Price
Average # Sold

Total Food Cost = Average Total Food Cost
Number of Menu Items

Average Total Food Cost = Weighted Average Item Food Cost
Average # Sold

Total Contribution Margin = Average Total Contribution Margin
Number of Menu Items

Total # Sold = Average # Sold
Number of Menu Items

Average Total Food Cost = Weighted Average Food Cost %
Average Total Sales

Average Total Contribution Margin = Weighted Average Item Contribution Margin
Average # Sold
A × B × C × D = Goal Value
where
   A = 1.00 – Food Cost %
   B = Item Popularity (Number Sold)
   C = Selling Price
   D = 1.00 – (Variable Cost % + Food Cost %)

(1.00 – Food Cost %) x Number Sold x Selling Price x [1.00 – (Variable Cost % + Food Cost %)] = Goal Value

A = \frac{GV}{B \times C \times D}

B = \frac{GV}{A \times C \times D}

C = \frac{GV}{A \times B \times D}

D = \frac{GV}{A \times B \times C}

Chapter 8 - Revenue Management for Hotels

Normal Format for the Income Statement

   Operated Department Income (Rooms)
+ Operated Departments Income (Excluding Rooms)
- Undistributed Operating Expenses
- Non-Operating Expenses
- Taxes
= Net Income

Bottom-Up Format for the Hubbart Formula

   Net Income
+ Taxes
+ Non-Operating Expenses
+ Undistributed Operating Expenses
- Operated Departments Income (Excluding Rooms)
= Operated Department Income (Rooms)

Owner’s Investment x Required Rate of Return = Hotel’s Target Net Income
After-Tax Net Income (ROI) = Before-Tax Net Income
1.00 – Tax Rate

Rent, Property Taxes, and Insurance
+ Depreciation and Amortization
+ Interest Expense
= Total Non-Operating Expenses

Administrative and General
+ Information Systems
+ Human Resources
+ Security
+ Franchise Fees
+ Transportation
+ Marketing
+ Property Operations and Maintenance
+ Utility Costs
= Total Undistributed Operating Expenses

Food
+ Beverage
+ Telecommunications
+ Other Operated Departments
+ Rentals and Other Income
= Total Operated Departments Income Excluding Rooms

Before-Tax Net Income
+ Total Non-Operating Expenses
+ Total Undistributed Operating Expenses
+ Total Operated Departments Income Excluding Rooms
= Operated Department Income for Rooms

Number of Available Rooms x 365 Days in a Year x Occupancy % = Number of Rooms
to be Sold in the Year

Number of Rooms to be Sold in the Year x Expense per Room = Estimated Room Expenses

Operated Department Income for Rooms
+ Estimated Rooms Expenses
= Estimated Rooms Department Revenues

Estimated Rooms Department Revenues = Hotel’s Required ADR
Estimated Number of Rooms to be Sold
Purchase Price = Average Cost per Room
Number of Rooms

Average Cost per Room = ADR
$1,000

Total Realized Revenue = Yield
Total Potential Revenue

ADR x Occupancy % = RevPAR

Rooms Sold = Occupancy %
Total Rooms in Hotel

Rooms Sold + Comp Rooms Occupied = Occupancy %
Total Rooms in Hotel

Rooms Sold = Occupancy %
Total Rooms in Hotel – OOO Rooms

Rooms Sold = Occupancy %
Total Rooms in Hotel – On-Change Rooms

Total Rooms Revenue = ADR
Total Number of Rooms Sold

Total Rooms Revenue = ADR
Total Number of Rooms Occupied

Room Rate - Reservation Generation Fees = Net ADR Yield
Room Rate Paid

GOP This Year- GOP Last Year = Flow-Through
Total Revenues This Year – Total Revenues Last Year

Gross Operating Profit = GOP-PAR
Total Rooms Available to Be Sold

Chapter 9 - Managerial Accounting for Costs

Revenue – Expenses = Profit

Revenue = Profits + Costs
Variable Cost per Guest (VC/Guest) x Number of Guests = Total Variable Cost

Total Variable Cost = VC/Guest

Number of Guests

Fixed Cost + Variable Cost = Total Mixed Cost

Fixed Cost + (Variable Cost per Guest x Number of Guests) = Total Mixed Cost

\[ \frac{\text{High Cost} - \text{Low Cost}}{\text{High # of Guests} - \text{Low # of Guests}} = \text{Variable Cost per Guest (VC/Guest)} \]

Mixed Cost – Total Variable Cost = Fixed Cost

Fixed Costs + Variable Costs = Total Costs

Fixed Costs + (Variable Cost per Guest x Number of Guests) = Total Costs

\[ y = a + bx \]

\[ \frac{\text{Total Overhead}}{\text{Number of Profit Centers}} = \text{Overhead Allocation per Profit Center} \]

Total Sales – Variable Costs = Contribution Margin

SP/guest – VC/guest = CM/guest

SP% – VC% = CM%

\[ \frac{\text{Fixed Costs}}{\text{Contribution Margin %}} = \text{Break-Even Point in Sales Dollars} \]

\[ \frac{\text{Fixed Costs}}{\text{Contribution Margin per Guest}} = \text{Break-Even Point in Guests Served} \]

Fixed Costs + Before-Tax Profit = Sales Dollars to Achieve Desired After-Tax Profit

\[ \frac{\text{Fixed Costs}}{\text{Contribution Margin %}} = \text{Sales Dollars to Achieve Desired After-Tax Profit} \]

\[ \frac{\text{After-Tax Profit}}{1 - \text{Tax Rate}} = \text{Before-Tax Profit} \]

\[ \text{Fixed Costs + Before-Tax Profit} = \text{Sales Dollars to Achieve Desired After-Tax Profit} \]

\[ \frac{\text{Fixed Costs}}{\text{Contribution Margin %}} = \text{Sales Dollars to Achieve Desired After-Tax Profit} \]
Fixed Costs + Before-Tax Profit = Number of Guests to Achieve Desired Contribution Margin per Guest After-Tax Profit

Projected Sales – Breakeven Sales = Margin of Safety

\[
\frac{\text{Minimum Labor Cost}}{1 - \text{Minimum Operating Cost}} = \text{MSP}
\]

\[
\frac{\text{Minimum Labor Cost}}{1 - (\text{Food Cost \% + Variable Cost \%})} = \text{MSP}
\]

Chapter 10 - Forecasting In the Hospitality Industry

\[
\text{Total Sales} \quad = \quad \text{Average Sales per Guest (Check Average)} \quad \frac{\text{Number of Guests Served}}{}
\]

Sales This Year – Sales Last Year = Variance

\[
\frac{\text{Variance}}{\text{Sales Last Year}} = \text{Percentage Variance}
\]

\[
\frac{\text{Sales This Year} - 1}{\text{Sales Last Year}} = \text{Percentage Variance}
\]

Sales Last Year + (Sales Last Year x % Increase Estimate) = Sales Forecast

Sales Last Year x (1 + % Increase Estimate) = Sales Forecast

Guest Count Last Year + (Guest Count Last Year x % Increase Estimate) = Guest Count Forecast

Guest Count Last Year x (1.00 + % Increase Estimate) = Guest Count Forecast

Last Year’s Average Sales per Guest + Estimated Increase in Sales per Guest = Sales per Guest Forecast

\[
\frac{\text{Sales Forecast}}{\text{Guest Count Forecast}} = \text{Average Sales per Guest Forecast}
\]

\[
\frac{\text{Rooms Sold}}{\text{Rooms Available for Sale}} = \text{Actual Occupancy \%}
\]
Rooms Forecasted to be Sold = Occupancy Forecast %  
Rooms Available for Sale

    Total Rooms Available
    - Out-of-Order Rooms
    Net Availability

Stayovers
+ Reservations (Arrivals)
Rooms Sold or Reserved

    Rooms Sold or Reserved
    - No-Shows
    - Early Departures
    + Overstays
    Total Forecast Sold or Reserved after Adjustments

Total Forecast after Adjustments = Occupancy Forecast
Net Availability

Chapter 11 – Budgeting and Internal Controls

Budgeted Revenue – Budgeted Expense = Budgeted Profit

Sales Last Year x (1 + % Increase Estimate) = Sales Forecast

Selling Price Last Year x (1 + % Increase Estimate) = Selling Price Forecast (Check Average)

Sales Forecast x Targeted Cost % = Forecasted Cost

Cost per Cover Last Year x (1 + % Increase Estimate) = Cost per Cover Forecast

Cost per Cover Forecast x Forecasted Number of Covers = Forecasted Costs

Sales Forecast x Labor Cost % Standard = Forecasted Labor Cost

Forecasted Labor Cost x Payroll Allocation % = Budgeted Payroll Allocation

Forecasted Labor Cost – Budgeted Payroll Allocation = Budgeted Payroll

Budgeted Payroll – Salaries and Fixed Wages = Budgeted Hourly Payroll
Actual Expense – Budgeted Expense = Variance

\[
\text{Variance} = \text{Percentage Variance}
\]

\[
\frac{\text{Actual Expense}}{\text{Budgeted Expense}} - 1 = \text{Percentage Variance}
\]

Chapter 12 - Capital Investment, Leasing, and Taxation

Initial Investment + Return on Investment = Total Investment Value

Future Value = Investment Amount x (1 + Investment Earnings %)^n

\[
FV_n = PV \times (1+i)^n
\]

Present Value = \frac{\text{Future Value}}{(1 + \text{Investment Earnings %})^n}

\[
PV = \frac{FV_n}{(1 + i)^n}
\]

Money Earned on Funds Invested = ROI

\[
\text{Money Earned on Funds Invested} = \text{ROI}
\]

Funds Invested

Annual Savings = Savings Rate of Return

\[
\text{Annual Savings} = \text{Savings Rate of Return}
\]

Capital Investment

Capital Investment = Payback Period

\[
\text{Capital Investment} = \text{Payback Period}
\]

Annual Income (or Savings)

Net Operating Income = Cap Rate %

\[
\text{Net Operating Income} = \text{Cap Rate %}
\]

Investment Amount

Net Operating Income = Cap Rate %

\[
\text{Net Operating Income} = \text{Cap Rate %}
\]

Property Value

Net Operating Income = Property Value Estimate

\[
\text{Net Operating Income} = \text{Property Value Estimate}
\]

Cap Rate %

Net Operating Income = Debt Coverage Ratio

\[
\text{Net Operating Income} = \text{Debt Coverage Ratio}
\]

Interest Payment