Learning Module 12: Introduction to Financial Statement Modeling

LOS 12a: demonstrate the development of a sales-based pro forma company model

A sales-based proforma company model helps in forecasting a company's financial performance based on **predicted future sales**. This model plays a crucial role in strategic planning, providing insights for making informed business decisions. It uses various assumptions regarding sales growth and related costs and is essential for capital budgeting, financial planning, and for assessing the impact of different operational strategies.

Steps to Develop a Sales-Based Proforma Company Model

Step 1: Estimate Revenue Growth and Future Revenue

Begin by estimating the revenue growth and future revenue for the company. Analyze the historical data to understand the past growth trends. Consider the market growth, market share, or growth relative to GDP to make an accurate projection. For instance, if the historical growth is 5% and the market is expected to grow by an additional 10%, adjust the future revenue projections to reflect these factors.

Step 2: Estimate COGS (Cost of Goods Sold)

Next, project the COGS based on a set percentage of sales or utilize a more detailed approach that considers the business strategy and competitive environment. If there are anticipated changes in the supply chain or production costs, adjust the projections accordingly. For example, if the sales are projected to be $1 million and historical COGS is 60% of sales, estimate the COGS at $600,000.

Step 3: Estimate SG&A (Selling, General and Administrative Expenses)

In this step, determine whether SG&A will be fixed or grow with revenue. Utilize historical data and trends to inform this projection. For instance, if SG&A historically grows at a similar rate to revenue, apply this trend to future projections to estimate the SG&A expenses.

Step 4: Estimate Financing Costs

Estimate the financing costs by considering current interest rates and debt levels. Consider any anticipated changes in capital expenditures or financial structure that may impact the financing costs. For example, if the company is planning a significant capital expenditure, factor in the increased financing costs related to the additional debt.

Step 5: Estimate Income Tax Expense and Cash Taxes

For estimating income tax expense and cash taxes, apply the historical effective tax rates to the income projections. Consider different tax jurisdictions and anticipated growth in high- and low-tax segments, and adjust for any changes in deferred tax items. For example, if the effective tax rate has been 20%, apply this rate to the pre-tax income projections.

Step 6: Model the Balance Sheet

Project the working capital accounts based on the items that flow from the proforma income statement. Ensure that the current assets and liabilities align with the projected revenue and expenses. For instance, if revenue is projected to increase, account for corresponding increases in accounts receivable and inventory in the balance sheet.

Step 7: Estimate Capital Expenditures and Net PP&E

To estimate capital expenditures and net PP&E, project both depreciation and capital expenditures, considering both maintenance and growth. Utilize these estimates to project net property, plant, and equipment (PP&E) for the balance sheet. For instance, if planning to purchase new equipment, increase the capital expenditure projections and update the net PP&E accordingly.

Step 8: Construct a Proforma Cash Flow Statement

Finally, use the completed pro forma income statement and balance sheet to construct the pro forma cash flow statement. Ensure all cash inflows and outflows are accounted for, aligning with the projected operations, financing, and investing activities. Utilize the net income from the proforma income statement, adjust for non-cash expenses, and account for changes in working capital to project the cash flows from operations.

Question

XYZ Inc., a growing technology company, is preparing a sales-based proforma model to forecast its financial position for the next year. The firm has consistently shown a revenue growth of 8% over the past five years. The company's Cost of Goods Sold (COGS) has been around 45% of the sales. The expected operating expenses, including Selling, General, and administrative expenses (SG&A), are estimated to grow at 2% annually. The management plans to make substantial capital expenditures in the upcoming year due to expansion. The company also anticipates changes in the financial structure, which will affect its financing costs.

As a financial analyst, which of the following steps would be the most crucial in ensuring the accuracy and reliability of the proforma model for XYZ Inc.?

A. Keeping the COGS and SG&A expenses fixed based on historical data.
B. Focusing primarily on estimating revenue growth.
C. Giving due consideration to anticipated changes in capital expenditures and financial structure.

Solution

The correct answer is C.

In the development of a proforma model, all aspects, like revenue growth, COGS, and operating expenses, are crucial. However, for XYZ Inc., which anticipates significant capital expenditures and changes in financial structure, giving due emphasis to these aspects is paramount. Estimating the impact of these changes on financing costs and other related elements is essential to ensure the proforma model's accuracy.

A is incorrect. Relying strictly on historical data for COGS and SG&A without accounting for the projected growth and changes in the company's operations may lead to inaccurate projections. These figures are likely to change with the anticipated capital expenditure and alterations in financial structure.

B is incorrect. While revenue growth estimation is vital, focusing solely on it could overlook other significant aspects like changes in capital expenditures and financial structure, which XYZ Inc. anticipates. Proper attention to these elements is crucial for a balanced and reliable proforma model.

LOS 12b: explain how behavioral factors affect analyst forecasts and recommend remedial actions for analyst biases

Financial statement models are not immune to behavioral biases. Analysts must be aware of the impact of behavioral biases and solutions to improve investment decisions and forecasts. The five key behavioral biases are overconfidence, conservatism, confirmation bias, the illusion of control, and representativeness.

Overconfidence

Overconfidence is a behavioral bias where analysts may overestimate their ability to forecast accurately. An analyst might place excessive trust in their financial analysis models, neglecting to consider potential external factors that can drastically affect a company's performance. This misplaced confidence can lead to inaccurate and unreliable predictions, potentially causing substantial financial misjudgments. To counteract overconfidence, analysts should routinely compare their forecasts with actual outcomes and adjust their models and assumptions accordingly. Embracing feedback and critiques can also help in ensuring diverse perspectives inform their analysis.

Conservatism

Conservatism bias can result in analysts being excessively cautious in their forecasts. They might be slow in updating their forecasts with new and relevant information, leading to predictions based on outdated or incomplete data. For example, an analyst may hesitate to update an earnings estimate despite significant market shifts, leading to forecast inaccuracy. A systematic and timely review and integration of new data into forecast models can help alleviate conservatism bias, ensuring predictions remain relevant and informed.

Confirmation Bias

Confirmation bias sees analysts focusing on information that confirms their existing beliefs while ignoring data that contradicts them. An analyst might unconsciously give more weight to positive information about a company they favor, overlooking potential red flags or negative data. This selective attention can lead to biased and skewed forecasts. Actively seeking diverse sources of information and opinions can help mitigate this bias, ensuring a more balanced and objective analysis.

Illusion of Control

The illusion of control bias involves analysts believing they have more control over events and outcomes than they actually do. For instance, they might assume that their thorough analysis can accurately predict stock price movements, ignoring other uncontrollable, impacting factors. Acknowledging the inherent uncertainties in forecasting and employing varied analytical approaches, like scenario analysis, can help counter this bias, leading to more realistic and reliable predictions.

Representativeness

Representativeness bias can cause analysts to incorrectly assess the relevance of certain information, considering it more indicative of future events than it truly is. An analyst might wrongfully assume a company's past performance is a reliable indicator of its future success, leading to potential forecasting errors. Ensuring a comprehensive and diverse range of factors and data sources inform analysis can help overcome this bias, fostering more robust and accurate financial forecasts.

Question

Sophia, a financial analyst, has been closely monitoring the growth of a start-up tech company, TechGrowth Inc. The firm has experienced consistent revenue growth over the past five years, leading many analysts to predict a continuation of this trend. Despite a recent report highlighting potential legal issues that could affect TechGrowth Inc.'s operations, Sophia is convinced the company's revenue will continue to grow unimpeded. She bases her projection on the company's past performance, assuming it will consistently replicate its success in the future.

Which of the following biases is Sophia ***most likely*** exhibiting in her analysis?

A. Representativeness Bias
B. Conservatism Bias
C. Illusion of Control Bias

Solution

The correct answer is A.

Sophia exhibits representativeness bias. This bias occurs when individuals unjustly categorize new information based on past experiences or classifications, often leading to base rate neglect. Sophia's assumption that TechGrowth Inc. will persistently replicate its past success in the future, despite new information about potential legal issues, is a manifestation of this bias. She erroneously believes that the firm's future growth will mirror its past growth based on the pattern observed in the previous years.

B is incorrect. Conservatism bias involves the reluctance to revise one's belief upon receiving new information. Although it might appear that Sophia is ignoring the report about potential legal issues, her decision is based on the perceived relevance of past performance to future growth rather than an unwillingness to adjust her predictions in light of new information, making representativeness bias a more

accurate characterization of her behavior.

C is incorrect. The illusion of control bias would entail Sophia believing that she can influence or control outcomes that are actually beyond her control. In this scenario, Sophia is not attempting to control the outcomes; rather, she is making a predictive error based on past performance, aligning more with representativeness bias.

LOS 12c: explain how the competitive position of a company based on Porter’s five forces analysis affects prices and costs

In analyzing a company's competitive position, Porter's Five Forces framework is a valuable tool. This model evaluates the influence of five key industry factors: competitive rivalry, threat of new entrants, bargaining power of suppliers, bargaining power of buyers, and the threat of substitutes on prices and costs. By understanding these forces, businesses can strategize effectively to optimize their profitability and market standing. Each force brings unique challenges and influences that can significantly affect a company's pricing and cost structure.

Competitive Rivalry

High competition among industry rivals leads to significant pricing pressures. Companies frequently lower prices to attract customers in a crowded market, diminishing the profit margins. Moreover, the need to stand out in the competition escalates costs due to necessary investments in marketing, innovation, and product differentiation. For instance, the smartphone industry experiences this phenomenon. Brands like Apple and Samsung often engage in pricing wars while concurrently spending substantially on research, development, and marketing to distinguish their products and features.

Threat of New Entrants

The threat of new entrants in the industry further exerts pressure on established companies. The entry of new competitors can lead to reduced prices and increased marketing spending to retain market share, further impacting the profitability of existing companies. Consider the airline industry; the emergence of low-cost carriers compelled established full-service airlines to reevaluate their pricing models, often leading to the introduction of more competitive fares to retain market share.

Bargaining Power of Suppliers

Additionally, the bargaining power of suppliers plays a critical role in determining a company's costs. Suppliers with considerable power can command higher prices for raw materials or services. This increase in input costs is often passed on to the customers in the form of higher prices, impacting the demand. For example, a unique computer hardware manufacturer might charge a high price and force computer companies to elevate their product prices, possibly reducing demand.

Bargaining Power of Buyers

On the other side, the bargaining power of buyers significantly impacts a company's pricing strategy. When buyers, especially large retail chains, hold substantial power, they can demand lower prices, forcing companies to reduce their prices and impacting their overall profitability. For example, retail giants like Walmart can effectively negotiate for lower prices from suppliers, who then might have to cut their prices, negatively impacting their profit margins.

Threat of Substitutes

Lastly, the threat of substitute products also affects a company's pricing and innovation strategies. Companies are compelled to keep their prices competitive and continually innovate to ensure customer loyalty. The rise of plant-based meat alternatives serves as an illustrative example. Traditional meat producers now face the challenge of retaining customers, leading to necessary innovation and reconsideration of pricing strategies.

In conclusion, a robust understanding of the dynamics outlined in Porter's Five Forces analysis is crucial for companies to navigate the complexities of industry competition, pricing pressures, and cost influences. Each force presents distinct challenges and opportunities, making it essential for businesses to continually evaluate and adjust their strategies for sustained competitiveness and profitability.

Question

A company operates in an industry with high competitive rivalry and strong bargaining power of buyers. This firm is also facing a significant threat from substitute products. Given this situation, the company is considering two options: one is to differentiate its products, and the other is to cut prices.

Based on Porter's Five Forces analysis, which of the following is the ***most likely*** outcome if the company decides to lower its prices?

A. The company will enhance its market share significantly with little impact on profitability.
B. The company will reduce its profitability while not substantially improving its competitive position.
C. The company will strengthen its competitive position by effectively countering the threat from substitutes.

Solution

The correct answer is B.

In an industry marked by high competitive rivalry and significant bargaining power among buyers, lowering prices may not significantly enhance market share as competitors may quickly follow with price cuts of their own. This strategy could further erode profitability without substantially enhancing the firm's competitive standing.

A is incorrect. Given the intense competitive rivalry and strong bargaining power of buyers, a price reduction might be quickly matched by competitors, leading to little or no gain in market share while profitability is impacted.

C is incorrect. Lowering prices is not an effective strategy to counter the threat from substitutes. Differentiation, by contrast, would be a more effective approach to mitigate the risk of substitution as it emphasizes unique product features or brand

appeal that substitutes might lack.

LOS 12d: explain how to forecast industry and company sales and costs when they are subject to price inflation or deflation

The process of forecasting industry and company sales amidst inflation or deflation is intricate and essential. The shifting tides of economies impact industries and individual companies, affecting sales volumes, prices, and costs. It is vital for analysts to adeptly understand and navigate these complexities to ensure accurate and reliable sales forecasts. We delve deeply into understanding these scenarios, focusing on essential aspects such as input costs, pricing strategies, and their potential impact on sales and revenues.

Industry Sales in an Inflation Scenario

During inflation, the rise in general price levels can affect the demand for various products and services, causing potential shifts in industry sales. One of the essential components to consider here is the input costs, which can vary significantly across industries. Examples include the cost of jet fuel for airlines, grain costs for cereal and baking companies, and coffee bean costs for coffee shops. These variable costs can notably affect earnings, impacting an industry's forecasted sales figures. It's crucial to analyze how changes in these costs could potentially be passed on to customers and the expected effect of such price increments on sales volume and revenue.

For instance, an industry heavily reliant on a specific raw material, the price of which has surged, might face increased production costs. If these costs are transferred to the end consumer, the industry may witness a drop in sales volume, reflecting the inverse relationship between price and demand.

Company Sales in an Inflation Scenario

Inflation also has direct implications for individual company sales forecasts. Companies exposed to significant commodity-type inputs could implement hedging strategies through derivatives or fixed-price contracts to mitigate the impact of rising input prices on costs and earnings. This

hedging can delay the effect of input price changes, allowing the company more time to adjust and strategize.

Companies that are not hedging and are not vertically integrated face challenges. Analysts must determine how swiftly and to what extent a cost increase can be passed on to customers. The strategy a company adopts in response to inflation, such as switching to substitute inputs or delaying price increases to gain market share, plays a crucial role in forecasting its sales.

For example, a company might choose to absorb the increased costs temporarily to maintain its customer base and sales volume, anticipating that the inflation is a short-term scenario. This action would affect the profit margins but could potentially safeguard the company's market share and sales volume, impacting the overall sales forecast.

The nuanced understanding of these facets, considering the unique industry and company characteristics, is imperative for creating a comprehensive and accurate sales forecast in an inflationary environment.

Industry Sales in a Deflation Scenario

In a deflationary environment, the general decline in price levels might increase the purchasing power of consumers, potentially leading to a surge in demand for various products and services. However, companies may not always be prepared to meet this increased demand, leading to supply shortages and other operational challenges. Understanding these dynamics is crucial for accurately forecasting industry sales in a deflation scenario. In such an environment, companies might be hesitant to lower prices further despite decreased costs, as this could lead to a price war and further diminish industry revenues. Companies might hold prices steady, betting on increased volume to drive revenue growth.

For instance, if companies reduce prices and see a proportional increase in sales, revenue remains steady, but it's a delicate balance. If the price reduction does not increase sales, revenues and profits could plummet, adversely impacting the entire industry. Analyzing the industry's historical price elasticity of demand can provide valuable insights for making accurate sales forecasts in a deflationary scenario.

Company Sales in a Deflation Scenario

When it comes to forecasting company sales in a deflationary context, a detailed examination of the firm's pricing strategy, cost structure, and potential operational adjustments is essential. Companies might adopt various strategies to maintain or enhance their revenue and profitability. Some might focus on enhancing operational efficiency to lower costs further, allowing them to maintain profitability even with lower sales prices. Others might opt to diversify their product offerings or explore new markets to offset the decline in revenue from existing products or markets.

An example here is a company facing deflation in its home market. Even if the company does not lower its prices, the general price decline might lead consumers to expect lower prices, which, if not met, could result in reduced sales volume. The firm may explore other markets where deflation is not a concern, maintaining its pricing structure and potentially offsetting losses in its home market.

Industry Costs in an Inflation Scenario

In an inflationary environment, forecasting industry costs is crucial. Input costs such as raw materials, energy, and labor significantly influence the industry's overall pricing strategy and profitability. In an inflation scenario, businesses should consider various strategic approaches to mitigate the impact. Companies dealing with commodity-type inputs could employ strategies like hedging their exposure to price changes or utilizing fixed-price contracts for future deliveries. This approach can help offset the short-term impact of inflation on input costs, providing companies with additional time to adjust their strategies to manage long-term inflationary pressures.

Consider the airline industry, where oil price surges can significantly elevate operational costs. Airlines might implement hedging strategies to secure current fuel prices, mitigating their risk against future inflation in fuel costs.

Company Costs in an Inflation Scenario

For a specific company facing inflation, cost forecasting necessitates a comprehensive exploration of the firm's operational and financial details. The company's approach to managing and offsetting cost increases is pivotal. Firms may attempt to transfer the augmented costs to customers, but this move is contingent on the demand elasticity for their products. If the demand is elastic, a price hike could lead to a substantial decline in sales volume, ultimately diminishing total revenue. Scrutinizing a company's historical pricing strategies, cost management techniques, and demand elasticity provides valuable insights into its potential cost management in an inflationary context.

For example, a bakery grappling with escalating grain prices might find it challenging to relay the increased costs to consumers due to the availability of substitute products. The company might explore operational efficiencies, diversify product lines, or investigate alternative, cost-effective ingredients to maintain its cost structure.

Forecasting Industry Costs in a Deflation Scenario

In a deflationary scenario, the cost structure of industries is affected differently. The prices of goods and services, including input costs, generally decrease. The challenge for industries lies in maintaining operational efficiencies and profitability when prices and revenue are declining. Industries must evaluate their fixed and variable costs and explore opportunities to renegotiate contracts, especially for commodity inputs that constitute a significant proportion of operational costs. Additionally, industries need to assess their production processes, ensuring they are as efficient as possible to counterbalance lower revenue streams with lower operational costs.

Let's look at an example. In a deflation scenario, a coffee shop chain might experience a decrease in the cost of coffee beans. While it could benefit from lower input costs, it's crucial to assess whether the price decline leads to increased competition and downward pressure on the prices they can charge consumers, possibly offsetting the advantage of lower costs.

Forecasting Company Costs in a Deflation Scenario

Strategic planning for cost forecasting is essential when a specific company is navigating a deflationary context. The firm should assess its supply chain, contractual obligations, and production efficiencies to optimize costs for the lower revenue environment. A detailed review of fixed and variable costs allows companies to identify potential areas for cost reduction or renegotiation, ensuring financial sustainability despite decreased pricing power and revenue.

Consider a manufacturing company during deflation. It might see a decline in the cost of raw materials. The company needs to scrutinize its other operational costs, ensuring they are streamlined to offset reduced revenue from lower product prices. It could renegotiate supplier contracts or optimize production processes to further reduce costs, ensuring financial stability in a deflationary environment.

Question

Which of the following is *most likely* a reason for a product's demand to be negatively affected by an increase in price?

A. Inflation
B. Price elasticity of demand
C. Exporting

Solution

The correct answer is B.

Price elasticity of demand measures the responsiveness of the quantity demanded of a good to a change in its price. When the demand for a product is elastic, a price increase will lead to a more than proportionate reduction in the quantity demanded, thus negatively affecting the demand. Consumers may opt for alternative goods or decide not to purchase the product at all, leading to a significant drop in sales volume.

A is incorrect. Inflation can lead to an increase in prices, but it does not specifically measure the responsiveness of demand to a change in price. The demand may or may not be significantly affected by inflation, depending on various other factors, including the elasticity of demand for the particular good.

C is incorrect. Exporting involves selling goods to other countries, and while it may be influenced by changes in price, it is not a measure of the responsiveness of demand to price changes. Exporting decisions are influenced by various factors, including exchange rates, global demand, and tariffs, and may not directly correlate with the price elasticity of demand for a particular good.

LOS 12e: explain considerations in the choice of an explicit forecast horizon and an analyst’s choices in developing projections beyond the short-term forecast horizon

The forecast time horizon is influenced by the following:

- **The investment strategy being considered:** Professionally managed equity investments have an investment timeframe or the average holding period for a stock, corresponding with the average annual portfolio turnover.
- **The cyclicality of the industry:** The forecast period should be long enough to allow the business to reflect average mid-cycle levels of revenue and profits.
- **Company-specific factors:** For example, acquisitions or restructuring activities. The effects of these factors need to be included in the forecasts.
- **The analyst's employer's preference:** If the employer requires the use of a dividend discount model and the company under evaluation does not currently pay dividends because it is not profitable, the analyst forecasts need to include a period where the company becomes profitable and pays dividends.

Longer-term projections often represent normalized earnings better than short-term forecasts when there are temporary items. Normalized earnings reflect mid-cycle earnings for a firm after excluding any unusual or temporary factors.

After forecasting for the forecast period, analysts estimate the terminal value based on long-term projections.

When using the **historical multiples-based approach** to estimate the terminal value of a company, the analyst assumes that the past is a good reflection of future expectations regarding growth expectations and required rates of return. The choice of the multiple should be consistent with the long-run expectations for growth and required return. Analysts use the historical average multiple as the basis for the target multiple when calculating the terminal value. Historical multiples are only relevant to the extent that future growth and profitability are expected to resemble the past. If the future is expected to be different from the past, a premium

or discount is applied to the historical multiple to reflect the difference in growth or profitability.

When using a ***DCF approach***, an analyst should consider whether the terminal cash flow will persist in the future. If it is not expected to persist in the future, an adjustment should be made to the terminal cash flow. Additionally, analysts should consider whether the future long-term growth rate will differ from the historical growth rate.

Challenges in Long-Term Forecasting

A significant challenge in forecasting beyond the short-term forecast horizon is anticipating ***inflection points*** when the future looks different from the past. The discount cash flow model relies on perpetuity calculation, assuming that the previous period's cash flows grow at a constant rate forever. For this reason, the cash flow must be normalized.

Long-term growth is a key input in the perpetuity calculation. Some companies and industries can grow faster than the overall economy for long periods. However, long-term forecasting comes with the challenge of anticipating inflection points, where the future will significantly differ from the recent past. Sources of such differences include economic disruption, changes in the business cycle stage, government regulation, and technology.

Question

Which of the following is the *least likely* an approach for forecasting the terminal value?

A. Historical multiples-based approach.
B. DCF approach.
C. Inflection points.

Solution

The correct answer is C.

Inflection points are not an approach to forecasting the terminal value. These are points when the future looks different from the past.

B is incorrect. The DCF approach is one of the ways an analyst would use to estimate the terminal value. Under the DCF approach, an analyst considers whether the terminal cash flow and the future long-term growth rate will persist.

A is incorrect. The historical multiples-based approach is used to estimate the terminal value. Analysts use the historical average multiple as the basis for the target multiple when calculating the terminal value. Historical multiples are only relevant to the extent that future growth and profitability are expected to resemble the past.