How Microeconomics Works Within a Firm

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While it is a widespread practice for business majors to take the microeconomics course in the early years of their college education, for most students it is followed by courses in other disciplines such as accounting, finance, and marketing. In turn, in these disciplines, the formulation of theory, models and examples involve use of nomenclature specific to that discipline such as accounting and financial performances. Sometimes the word "economic" measure does appear in these discipline specific courses. Many of these concepts and models with resulting measures though perceived to be developed in different business disciplines, they originate from or developed utilizing the micro economic theory. In this study, we plan to link together the microeconomic theory and its applications in development of concepts and models in other disciplines so that student and practitioners will be able tie in a seamless manner, and if necessary, modify these concepts to apply and solve business issues in a firm.

Keywords: microeconomics, average cost and revenue, marginal cost and revenue, fixed and variable cost, opportunity cost, indifference curve, utility function, risk and return, capital budgeting

INTRODUCTION

The economic theory identifies the firm's goal as maximizing its economic profit, which is reflected in its share price. To that end, microeconomics studies decisions related to the utilization and distribution of resources. It attempts to explain why these resources carry different values and how businesses and individuals may benefit from efficient allocation for production, exchange, and consumption of goods. Microeconomists develop several types of models using logic and human behavior, then evaluate these models using actual data. It deals with (1) consumer behavior and incentives via the theory of utility and producer behavior involving a combination of inputs to maximize profit or minimize cost, and (2) the theory of price which involve the combining the utility and production theory in a competitive market. Of course, the examples in the microeconomic textbooks are limited to economic variables so that students can understand the basic concepts.

A business manager needs to assess the economic policies and activities in (1) the entire economy and (2) its industry, but more importantly needs to understand how to apply micro economic principles and theory to use the right economic principle to increase his/her company's shareholder value. In the business world, the financial models are used to apply the microeconomic theory's concepts of marginal revenue and costs, fixed cost, variable cost, and the opportunity cost of financing, and then the accounting principles are used to track these variables to derive the optimal solution for the firm.

First, we revisit the basic microeconomics principles and the textbooks about theory and principles of microeconomics and are included in the bibliography. Next, we identify accounting and specifically finance

functions within a firm's business operations and planning. The accounting, finance and investment textbooks provide the basic issues the finance professionals encounter in the short- and long-run and are included in the bibliography. Finally, we identify and link the microeconomic principles which are intertwined in financial performance measures and models and utilized knowingly or unknowingly by the financial analysts and managers to maximize their shareholders' values. Finally, our goal is to help business managers understand how microeconomic principles have been used in the business world and learn how to develop and apply new techniques using a combination of these academic disciplines to solve business problems in a firm.

WHAT IS MICROECONOMICS?

Microeconomics is the analysis of individuals, households, and firms' actions in allocating resources and studying their decision-making process. That is, it encompasses the behavior of three different units, i.e., consumes, resource owners and firms The theory of the firm is a microeconomic model or an idea that conceptualizes that a business organization or a firm with different structures produces and sell goods and services. These organizations such as a corporations identify their customers, and then decides how much and how should they produce goods. Microeconomics involves studying a firm's process of decision making in allocation of its resources to maximize its economic profit. This economic profit differs from the accounting profit, for instance, it includes opportunity costs not included in the income statement. These opportunity costs are estimated from what they could earn in their best alternative and use of the firm's existing resources already paid for.

Microeconomics conceptualizes actions of Individuals in their households or specifically at their workplaces to business issues they encounter daily are related to the incentives. Individuals as consumers, tend to spend their limited budget to acquire and use a set of goods that will amplify their satisfaction or "utility." This is known as the utility theory. Producers of goods and services adopt a process design in combination with a set of available inputs to produce outputs that will minimize cost and maximize their profit. This is known as the production theory. The integration of the utility theory and the production theory leads to the theory of supply and demand, which helps to understand the determination of prices in a perfectly competitive market, and in such markets when the producers and consumers agree on a certain price, it leads to an economic equilibrium.

Demand, Supply and Equilibrium

The Demand Curve

If an individual's tastes and income are held constant, then by changing the price of the commodity one can obtain the individual's demand for the commodity. As the price of a commodity falls, an individual will purchase more quantity of the commodity, also known as the law of demand, and as a result the demand curve always slopes downward. This movement along the demand curve is different from change in demand due to changes in technology which leads to shift in the entire demand.

The Supply Curve

A producer's cost of production depends on its inputs or factors of production, technology, etc. The quantity of commodity a producer will sell varies based on the commodity's price relative to the production cost. One can then derive an individual producer's supply curve by maintaining the cost of production factors constant but changing the commodity's price. As stated earlier, when the producers and consumers agree on a certain price, it leads to an economic equilibrium.

Price and Income Elasticities and Equilibrium

The sensitivity of demand to change in price is known as price elasticity. The coefficient of price elasticity of demand measures the percentage change in the quantity of a commodity demanded per unit of time resulting from a given percentage change in the price of the commodity. It is a function of the number of and closeness of substitutes, number of uses of commodity, expenditure, and the level of price. For

instance, at the upper end of the demand curve tends to be more elastic. Likewise, one can define an income elasticity of demand. Finally, the cross elasticity of demand measures the percentage change in the amount of commodity X purchased per unit of time resulting from a given percentage change in prices of commodity Y.

An individual demands a particular commodity because of satisfaction/ happiness or utility/value received from consuming it. A consumer wants a good because of the properties of the good, and it is these features and not the good itself that gives rise to utility. While the total utility increases with an increase in consumption, the marginal or incremental utility from consuming each additional unit of the commodity normally decreases. A consumer is in equilibrium when spending in such a way that the utility of the last dollar spent on numerous commodities is the same. An equilibrium is reached when a consumer's spending is such that the utility of the last dollar spent on numerous commodities is the same. These relationships are shown in the following equations:

MUx/Px = Muy/Py … subject to the constraint that PxQx + PyQy +… = M (individual's income),

where, MUx and MUy represent marginal utilities from consumption of commodities X and Y, respectively.
Px and Py represent price per unit of commodities X and Y, respectively.
Qx and Qy represent quantity of commodities X and Y, and finally.
M represents income a consumer can afford to spend on these commodities.

A consumer who is already in equilibrium may increase his/her total utility by switching commodities with another individual who is also in equilibrium but encountering a different set of prices.

Indifference Curve
An indifference curve shows the various combinations of a commodities X and Y which generate equal utility. The marginal rate of substitution of X and Y ((MRSxy)) denotes the amount of Y that a consumer is willing to give up acquiring one additional unit of X and while on the same indifference curve. As the individual moves down the indifference curve, the MRSxy decreases. Indifference curves are negatively sloped; they are convex to the origin, and indifference curves do not intersect. Finally, a higher indifference curve shows a greater amount of satisfaction. A consumer is in equilibrium when, for a given income and price constraints, the consumer maximizes the total utility from his or her expenditures. Finally, an Engel curve displays amount of a commodity that the consumer would buy per unit of time at various levels of total income.

Theory of Production
Assuming the best production techniques available are used, the production function for a commodity shows the relationship of the maximum quantity of the commodity that can be produced per unit of time for each set of alternative inputs. TP denotes the total output of product, the average product of labor is AP_L, and the marginal product of labor is MP_L. Finally, the falling portion of the MPL curve demonstrates the law of diminishing returns. An isoquant shows the production with two valuable inputs, i.e., the various combinations of labor (L) and capital (K) with which a firm can produce a given quantity of output. The marginal rate of technical substitution of L for K ($MRST_{LK}$) denotes how increasing the amount of L used by one unit, the amount of K a firm can give away and yet remain on the same isoquant. Additionally,

$$MRST_{LK} = MP_L/MP_K.$$

Once again, as the firm moves down an isoquant, the $MRST_{LK}$ diminishes. Like the indifference curves, (1) the isoquants are negatively sloped over a specific range, (2) isoquants do not cross, and (3) are convex to the origin. A producer achieves equilibrium upon attaining the highest isoquant. Of course, production involves costs, and isocost shows combinations of labor and capital that a firm can buy with its total

expenditure budget and factor prices. The slope of the isocost is $-P_L/P_K$ with P_L and P_K being labor and capital per unit prices, respectively. A producer attains equilibrium when for a given level of outlay, he or she maximizes its output or production. At equilibrium, the marginal product of the last dollar spent on capital is the same as the marginal product of the last dollar spent on labor. That is,

$$MPk/ Pk = MP_L/P_L$$

If the prices of capital and labor remain unchanged and the firm changes its total expenditure outlay, then the firm's isocost shifts parallel to itself. This leads to the derivation of expansion path, which is obtained by joining the producer equilibrium points. Finally, a firm achieves constant, increasing or decreasing returns to scale, when the inputs are increased in a given proportion, the production output of the commodity increases in the same, greater or in a smaller proportion negatively.

Technology advancements lead to increases in the productivity of inputs, that is, more output can be produces with lesser amounts of inputs and can be portrayed by a shift in the output or an isoquant. Additionally, for a given expenditure budget, a firm may utilize the various combinations of labor and capital to produce various levels of output, and one can generate the total product of labor (TPL) and from it, the average product of labor (APL) and marginal product of labor (MPL) and vice versa. Finally, the corresponding expenditures can be displayed by an isocost curve.

Cost of Production

A short run is defined as the time horizon the firm does not vary the quantity of all inputs. That is, some of the costs are fixed costs. In the long run, there are no fixed factors and therefore no fixed costs, which allows a firm to change the scale of the plant. Cost curves display the minimum cost of producing various output levels, including actual expenditures incurred on deploying the inputs and any opportunity costs including use of the firm's existing resources already paid for. These opportunity costs are estimated from what they could earn in their best alternative use. Average variable cost (AVC) equals total variable costs (TVC) divided by output, and the average fixed cost (AFC) equals total fixed costs (TFC) divided by output. Finally, the average cost (AC) equals total costs divided by output, and average cost (AC) = AFC+AVC. The marginal cost (MC) equals the change in TC or total variable cost (TVC) per unit change in output.

The long-run average cost curve (LAC) displays the minimum per-unit cost of producing each output level when a firm can build any needed plant scale. LAC is derived by a curve tangent to all the short-run average cost curves (SACS) signifying all the different plant sizes that the firm could construct in the long-run. In short, the LAC curve is the envelope of the SAC curves. Due to fixed costs, the SAC curves decline initially but then exhibit an upturn from the law of diminishing returns. On the other hand, the form of LAC curve is decided by economies and diseconomies of scale.

Long-run marginal cost (LMC) is calculated as the change in long-run total cost (LTC) due to one unit change in the output. The LTC curve displays the minimum total costs for producing a specific output if a firm can construct any required scale of plant. The LTC may be derived by joining tangency points to all the short-run total cost (STC) curves denoting different plant sizes that the firm could construct in the long run.

The Cobb-Douglas Production Function

The Cobb-Douglass is the commonly used production function in economic studies. The function is expressed by,

$$Q = AL^\alpha K^\beta.$$

where Q is the output and Land K are the inputs of capital and labor, respectively, and A, alpha and beta are the positive parameters. The values of these parameters vary by data in each case. The greater the value of A, the more advanced the technology. The parameters alpha and beta measure the percentage increase in Q resulting from one-percent increase in L while holding K constant, and beta measures the percentage

increase in Q due to a one percentage increase in K while holding L constant. Therefore, alpha and beta are the output elasticity of L and K, respectively. If alpha + beta =1, there are constant returns to scale and its isoquants are equally spaced and parallel along the expansion. If alpha + beta < 1, there are decreasing returns to scale, and If alpha+ beta > 1, there are increasing returns to scale.

Price and Output Under Perfect Competition

A market is said to be perfectly competitive if (1) there are numerous number of sellers and buyers of the commodity such that the actions of an individual cannot affect the price of the commodity, (2) firms consumers, and resource owners are perfectly knowledgeable about the present costs and future prices (2) all products for firms in the market are homogeneous, and (3) the resources are perfectly mobile. In a perfectly competitive market, the intersection of the market demand curve and the market supply curve for a commodity sets the price of the commodity, and at that price, the firm can sell any amount of the commodity. In the short run, also known as the market period, the supply of the commodity is fixed, and an equilibrium output is reached when the total profit, which is total revenue less total cost is maximum. In a perfectly competitive market, a firm maximizes its short-run total profits when marginal revenue equals price and the marginal cost is rising. In the short run, this is the optimum output level for the firm. In a perfectly competitive market, in the short run, if price per unit exceeds average cost per unit, the profit is maximum for a firm. If price (P) is less than AC but greater than AVC, the firm is attempting to minimize its losses, and finally, if P is less then both AC and AVC, then a firm should minimize the total losses by closing its business.

In the short run, a firm's supply curve is derived by the growing portion of its MC curve, which is above its AVC curve. In the long run, in a perfectly competitive market, a firm will continue to operate its business provided the total revenue exceeds total cost. The point can derive the optimum output or MR equals LMC and LMC is increasing. Of course, if the firm is profitable at this optimal level, then competitors will enter until profit are zero or almost zero. Assuming factor prices remain unchanged, this industry's long-run market supply curve is horizontal at the minimum LAC. Therefore, this industry is designated as a "constant cost industry." However, if factor prices increase the industry output is expanded leading to an "increasing cost industry." The industry's long-term supply curve is positively sloped, suggesting that in the long run, the greater looming outputs of the commodity will be produced only at higher prices. Of course, the opposite scenarios occur in the decreasing cost industry.

Price and Employment of Factors of Production

Both the price of a commodity and the price of a factor of production are determined by the intersection of market demand and supply in a perfectly competitive environment. A firm needs to utilize the best least-cost factors of production to produce its best level of output to maximize its total profit. In other words,

$$MPc/ Pc = MPd/Pd = 1/ MCq = 1/Pr$$

where, MP is the marginal product, P is the Price, MC is Marginal cost; C and D are factors of production, and Q and R are the commodity products.

We now discuss the application of microeconomic theory in other disciplines and how it is intertwined to solve operating and strategic business decisions in a firm. We proceed with the order of topics commonly discussed in basic accounting and specifically in finance textbooks. Once again, from a financial perspective, the firm's goal is to maximize its shareholder value, which is measured by a firm's share price. This share price is derived based on the amount of cash flows over both the short- and long-terms and the risks associated with these cash flows. Alternatively, one can arrive at the same valuation by measuring a firm's annual economic value added (EVA) and its market value added (MVA). It has been shown that these two approaches are equivalent and lead to the same goal of maximizing shareholder value.

MICROECONOMIC THEORY IN ACCOUNTING AND FINANCE FUNCTIONS IN A FIRM

Financial Statements and Analysis

In accounting, the procedure of recording debits and credits is known as bookkeeping, and a general ledger is a record-keeping process of these accounting transactions and is a backbone of the accounting system within a firm. An income statement is a ledger of detailed records of various sources of revenues and expenses. Specifically, an income statement ledger includes different streams of revenues and expense items. The balance sheet ledger includes various assets and liability items.

These general ledger transactions serve as an input to the development of the financial statements prepared by utilizing standardized generally accepted principles (GAAP) and include income statement, balance sheet, statements of working capital, stockholders' equity and the cash flow statement. In turn, these financial statements from the accounting department serve as the input to perform the financial analysis in the finance department. The comparison of a firm's financial performance measures both cross-sectional and the trend analysis with its competitors in conjunction with the narratives and recommendations during the monthly book close process serve as the output from the finance department. In turn, this output helps the management understand and take the necessary actions on an ongoing basis. These narratives are prepared by the finance department in collaboration with their colleagues in the sales and marketing, economics and forecasting groups, product management, production, and service departments. From the analysis of monthly variances of actuals from the budget and the underlying drivers at the business unit/division, market segment and the product levels help management to understand the microeconomic factors in its industry, which are affecting changes in the demand and supply, including the nature of the competition, factors and cost of production. This monthly process leads to the development of the quarterly and annual statements and sow's seeds for the preparation of the following year's budget and long-term plans.

Financial Planning

A firm's strategic plan is a long-term plan, which is generally a 5-year plan and encompasses all functional areas including and not limited to marketing, production, and financial plans. These plans then lead to the development of one- or two- years short-term plans, and finally to the annual operational and finance budgets for monthly tracking and reporting via the book-close process. The long-term plan is based on the forecast of the economy's growths and its industry, the sales growth rates for the firm itself, and the outlook for cost of production factors including capital and labor. In turn, the short-term operating and financial plans, which pave a path to formulating annual budgets, include trackable specific sales forecasts, production targets, direct labor, raw material requirements, operating and maintenance expenses, and overhead or fixed costs. The sales forecast is developed using a combination of (1) the bottom-up approach including input from the sales channels at each of the field sales offices and the business units/divisions and (2) the top-down approach of using external factors such as the overall economic conditions and the industry forecasts. A similar combination of internal and external forecasts is used in developing the short-term plans and budgets for formulation of the pro-forma income statements and balance sheets in the finance department and pro forma plans in the marketing, production, and the human resources organizations. The development of these plans is preceded by in-depth understanding of the current and future demand and supply conditions, competitors' plans, customer product/service and risk preferences, current state and the upcoming developments in production/service technologies and the pace of these changes.

Time Value of Money

Firms require analysts to use the time value of money techniques to justify funding for the planned investment in property plant and equipment for new programs, markets, and products. The shareholder value is derived from cash receipts and disbursements, and the timings of these cash inflows and outflows determine the economic and shareholder value. The time value of money helps to capture opportunity costs associated with undertaking a project.

Risk and Return

Risk is the probability of potential loss, and commonly referred to as the uncertainty created by variation in returns from investment in an asset. A rate of return is defined as the gain or loss in an investment and is measured as the income plus capital gain/loss during a specific period. A firm incurs both the variable costs and fixed costs. There are many sources of risks, and some are under a firm's control.

In a perfectly competitive market, in the short run, if price per unit exceeds average cost per unit, then firm can maximize its profit. A firm's total operating cost includes variable cost such as cost of goods sold and fixed costs such as general and administrative expenses, depreciation, etc. At the breakeven point, a firm's total revenue equals its cost, leading to a zero-operating profit. The uncertainty in pricing and quantity of products generates fluctuations in revenue/sales and can lead to losses. That is, as explained in the theory of microeconomics, if P is less than AC but greater than AVC, the firm is attempting to minimize its losses, and finally, if P is less then both AC and AVC, then a firm should minimize the total losses by closing its business. This uncertainty in pricing and revenue and the components of costs creates variations in potential profit or losses and is known as a firm's business risk. For instance, higher-risk capital projects tend to create variability in net income and cash flow. In turn, it leads to uncertainty in measurement of cash flow and selection of appropriate discount rates in capital budgeting decisions.

In addition, a firm may carry a debt burden, which requires an on-going payment of interest which the firm may be unable to make due to its low or lack of operating income. This uncertainty of not being able to service its debt is known as the financial risk of a firm. Of course, the firm and the shareholders encounter other types of risks, including economic and political risks known as market risks. Other risks commonly discussed in the finance are the tax, purchasing power, liquidity, interest rate, exchange rate, and even risk.

In a competitive marketplace, the marketing department may encounter issues related the estimation of demand for products and may require the use of sophisticated information system packages and the operations department needs to develop a rapid response time in its daily operations to avoid any adverse impact on a firm's goal of shareholder maximization.

Bonds and Stock Valuations

The financial theory argues that a rational investor first assesses a security's underlying risk and then determines its fair or intrinsic value by discounting the expected cash flow using a risk-adjusted discount rate. The expected rate of return is the return an investor looks forward to earning if he/she purchases the security at the prevailing market price. The efficient-market hypothesis states that all publicly available information about a firm is fully reflected in security prices, which, in turn, promptly change in response to any new information. Therefore, it implies that the securities trade at their fair prices, and an equilibrium occurs when the required rate of return or intrinsic value of a security equals the expected rate of return or the market price. In other words, it assumes a perfect market where all participants are rational and objective investors. There are similarities between the efficient market for securities as discussed above and a perfectly competitive markets for commodities in microeconomic theory, which states that in a perfectly competitive market firms, consumers, and resource owners are perfectly knowledgeable about the present costs and future prices and all products for firms in the market are homogeneous, and finally the resources are perfectly mobile.

However, some well-known investors have earned above normal rates of returns over a long run perhaps because they had anticipated the new information via their research of the firm and industry business operations or their interpretations of the new information and its impact on security prices were superior compared to others. Many practitioners and certain academics believe that market inefficiencies exist due to subjective or psychological factors and emotions on part of the investors. This has created a specialized research area known as behavioral finance. To that end, let us understand the functioning of the capital markets for long-term securities and how the practitioners engage in these fast-moving markets. Based on the publicly available information, researchers for brokerage firms, trusts, life insurance companies, etc. conduct in-depth research and forecast firms' cash flows for the foreseeable future. In addition, they assess the underlying risks to the business and derive a risk-adjusted discount rate. They employ several valuation techniques to bracket in a range of values for security. Here, the differences

emerge in the estimation of cash flows and the risk-adjusted discount rate. Therefore, the valuation of a security depends on the extent of the depth of the research and the objective and subjective views leading to the differences in the estimation of their intrinsic values. In turn, it leads them to conclude that security is undervalued, overvalued, or fairly priced. Similarly, the retail investors' subjective and objective estimates of these financial variables based on sometimes limited research produce their own intrinsic valuations of these securities. As if differences in these estimates are not enough, all market participants have their forecast of appreciation in a security price. These diverse participants then independently compare the intrinsic value with the security's price and issue buy or sell orders. These orders may be market, limit, or stop loss orders, or enter the broker's order book. Finally, these orders from all market participants generate the demand and supply in the market for this security, which determines an equilibrium price at that point in time. Of course, as the new information flows in, then this cycle is repeats until the market closes for that day.

Capital Budgeting

A firm's capital budget analyzes long-term projects for investments in gross fixed assets to increase or replace production capacity or its efficiency or make its manufacturing process safer. It involves making investment decisions to develop an annual capital budget and it includes financial decision techniques such as net present value (NPV), internal rate of return, (IRR) etc.

Incremental Cash Flow

The most crucial step in applying these techniques requires estimating the applicable project incremental free cash flows over the life of the project. It involves first defining the free cash flow. To that end, to derive the incremental free cash flow from a project, first the operating component of cash flow is calculated as operating income times (1- income tax rate) plus the depreciation less the change in net working capital, and then the investment component, which is capital expenditures is subtracted. Note that since the financing costs are embedded in the required rate of return used for discounting the incremental cash flow, these are excluded in the free cash flow calculation. It entails estimating the relevant incremental flows related to project sales, revenues, operating costs, investment in gross fixed assets and working capital from acceptance of the project. Finance textbooks commonly describe approaches in identifying the incremental cash flows in expansion projects, and replacement projects where the new operating costs net of current operating costs lead to the calculation of the incremental cash flow. However, numerous issues complicate finding the relevant incremental cash flow.

In microeconomic theory, a marginal revenue or cost is the change in total revenue or cost due to one additional unit of sale or production. This marginal concept is useful in analyzing a firm's sales and cost structure for a product and the firm and is a critical input for decision-making in pricing products and production. When the marginal revenue or cost of selling or producing one more unit is applied to selling or producing all (total) additional units, then it is known as incremental revenue or cost. The incremental revenue or costs can include both variable and fixed costs depending on the project under consideration. Therefore, in the business world, incremental revenue or cost is used in individual project analysis and long-term strategic planning.

Sunk Costs

In the business world, sunk cost is an outflow that has occurred in the past and cannot be recovered even if the firm accepts the project. Therefore, these costs are ignored in the capital budgeting process and are not included in a project's expected incremental cash outflow. The prevailing microeconomic theory states that in rational business decision – making only current alternatives with any impact on expected cash flow are relevant and is known as bygones principle or marginal principle. That is, past decisions involving any costs are irrelevant.

Opportunity Costs

A project requires investment in fixed assets. However, a firm may already own these assets, including a vacant warehouse, unused land, and machinery. Deploying these assets in a new project under consideration may preclude the firm from selling or renting these assets in the future. In microeconomics, it is known as the opportunity cost. Therefore, the cost of deploying these assets in a new project must be included in deriving the project's incremental cash flow.

Externalities

In microeconomics, if decisions about investment, production, and consumption affect others not directly involved in the transactions, then economists call it externalities. Specifically, the concepts of price and income elasticities and cross elasticities can help identify externality's impact. For instance, at the firm level, if undertaking a project affects other products or services of the firm or the environment, it is known as externalities. When it affects the firm's products or services, it is also known as cannibalization. For instance, if the existing customers were to switch from using its existing product to its new products, then this substitution effect is known as the negative externality.

On the other hand, if the introduction of new product increases the sales of other product (s) of the firm by its existing customers, then it is a complementary effect and is known as a positive externality. So, cannibalization can positively or negatively affect the incremental cash flow of a project under evaluation. Finally, if the acceptance of a project potentially affects the firm's external environment such as pollution, noise, safety., etc., any additional costs to negate these effects should be included in its incremental cash flow.

Cost of Capital

The cost of capital is related to the sources of funds from investors who provide long-term financing, including bonds, preferred stock, retained earnings and common stock. These are known as components of capital. The planned investments which generate positive NPVs or internal rates of return greater than the cost of capital are intended to increase the market value of its stock. The basic finance textbooks include discussions on how to calculate the cost of these components. The expected weighted average cost of capital (WACC) is calculated as the sum of the proportion of each financing component in the capital structure times the cost of each component. The proportion may be calculated based on market values rather than the historical book values or using target weights to achieve a firm's desired capital structure. The component cost of various financing sources increases with the increase in dollar amount of financing. In addition, any use of common stock financing after exhausting its internal source of funds from retained earnings will increase the weighted average cost of capital as the firm will incur the floatation cost. Both factors lead to the calculation of the weighted average marginal cost (WMCC) associated with an additional dollar of total new financing and is an increasing function of total new financing.

On the other hand, the investment opportunities set portrays the internal rate of return on new projects with additional dollar of financing of projects and is a decreasing function of total new financing. At the intersection point, the internal rate of return of a new project equals the weighted average marginal cost of capital of total new financing, and beyond that point any new project should be rejected as the IRR is less than the WMCC or the project NPV is less than zero. The above role of WMCC is like our discussion of microeconomic theory and specifically the section on price and output under perfect competition in microeconomic theory, which suggests in the long run the point can derive the optimum output or MR equals LMC and LMC is increasing.

Leverage and Capital Structure

Leverage originates from use of assets with fixed cost and use of long-term debt, and impacts the risk and return associated with a firm's free cash flow, and therefore its valuation. Leverage may be parsed into two components: (1) operating leverage associated with fixed operating costs, including marketing, general and administrative (G&A), and depreciation expenses. Higher operating costs lower the earnings before interest and taxes in the income statement, and (2) financial leverage which emanates from interest

obligations to the creditors for servicing the debt and promised dividends to the preferred stockholders. First, the fixed interest payments lower the net profit before taxes and then the promised fixed dividends on preferred stock lower the after- tax earnings to the common stockholders. The microeconomic principles are applied in finance by developing financial models and analytical techniques to measure financial performance. For instance, the breakeven analysis helps determine the sales in units or dollars needed to achieve zero earnings before interest and taxes. At that point, the sales net of variable costs will be just enough to cover the fixed operating costs. After the sales exceed the breakeven point, once it covers the variable and operating fixed costs, any further increase in sales directly leads to a proportionate increase in the earnings before interest and taxes (EBIT). For some firms, the economies of scale can be enormous. A finance manage can determine the percentage change in EBIT due to a percentage change in sales, which is also known as the degree of operating leverage. One may argue that where the effects of operating leverage end, the effect of financial leverage begins. The degree of financial leverage measures the percent change in earnings per share due to a percentage change in EBIT. Of course, the degree of total leverage combines both the operating and financial leverage and can be defined as the percentage change in earnings per share due a percentage change in sales. Finally, when a firm's weighted average cost is the lowest, the value of the firm the highest, and it leads to a firm's optimal capital structure, i.e., an optimal mix of debt and equity. This concept is like the microeconomic principle discussed earlier: in a perfectly competitive market, a firm maximizes its short-run total profits when marginal revenue equals price and the marginal cost is rising. In the short run, this is the optimum level of output for the firm in the firm.

Dividend Policy

The dividends are the source of income to the owners of the corporation or the shareholders, which in conjunction with the capital gains, are used for the stock's valuation. As a result, future dividends and any changes in the dividend policy convey information about the firm's financial prospects. Financial models have been developed to derive the dividend payout ratio, and one of these models utilizes the residual theory of dividends, which is commonly discussed in the finance textbooks. The first step in this financial model involves deciding the optimal level of a firm's capital expenditures. As discussed earlier, this optimal level is determined by the intersection of the investment opportunity schedule and the weighted average marginal cost of capital, a concept derived from the microeconomic theory. Then the amount of equity needed is calculated by applying the mix or the proportions of financing sources from its optimal capital structure to the capital expenditures. The firm may first use the retained earnings to meet the equity portion of the capital; if it is not sufficient, it may issue new common stock. This approach allows the firm to maintain or make progress towards its optimal capital structure. Of course, the relevance of dividend policy continues to be a topic of many theoretical and empirical studies.

Net Working Capital, Current Assets, and Current Liabilities Management

The current assets and current liabilities represent a sizable portion of the balance sheet. The net working capital represents a firm's net investment in the short term and is defined as the difference between a firm's current assets and current liabilities. The current liabilities are paid from the cash generated by the conversion cycle of current assets from inventories to receivables to cash. This conversion cycle may be calculated in days or dollars, and there is an opportunity cost associated with this cycle as pointed out in microeconomic theory. The cash conversion cycle in days is calculated as:

# of days in inventory + # of days in Accounts receivable - # of days in Accounts payables.

Alternatively, the cash conversion cycle in dollars is calculated as:

Inventory per day plus Accounts receivable per day less Accounts payable per day, where inventory per day equals annual sales times cost of goods as percent of sales times the ratio of average age of inventory divided by 365. Accounts receivable per day equals annual sales times average collection period divided by 365. Accounts payable per day equals annual sales times cost of goods sold times percentage of purchases related to the cost of goods sold divided by 365.

The sales pattern during a year will decide how the firm will utilize permanent or seasonal funding to finance its operating assets. This leads to the discussion of managing inventory account receivables and account payables. The economic order quantity (EOQ) captures the fixed order costs and the variable cost of carrying, which includes the opportunity cost of funding the inventory. This EOQ model helps to understand the dynamics between these two cost components to minimize the total inventory cost. Other techniques include just-in-time (JIT) and materials requirement planning (MRP) to manage the inventory process.

The second component is the accounts receivable management, which is commonly discussed in the finance textbooks. The financial performance measures such as accounts receivable turnover, helps to understand the number of days to convert the accounts receivable into cash and facilitate comparison with the industry standard. Any desired improvement in sales via increasing the turnover, which also accompanies an increase in bad-debt expense requires the application of microeconomic theory of marginal cost analysis. To that end, first using the required investment rate, calculate the marginal investment cost in accounts receivable. Next, calculate the cost of increase in marginal bad debt. Then the sum of the two costs' increases is compared with any additional profit from the increase in sales, and finally, account for any changes in the prevailing credit standard of the firm. Alternatively, to speed up the collection, a firm may provide cash discount partially offset by the decrease in profit due to the discount. The appropriate time period to accelerate the collection period is based on how many customers' accounts payable management will take advantage of the opportunity cost if they forgo the cash discount to improve their profitability. This will depend on the firm's and its customers' overall management of current liability, specifically the accounts payable policy discussed in finance textbooks. In the same vein, a firm may perform similar marginal cost and profit analysis, including opportunity cost to factor accounts receivable, i.e., selling the accounts receivable for cash at a discount and pledging its inventory to obtain a secure loan. We now turn to another area of finance, i.e., how professional portfolio managers and retail investors make investment decisions using the risk and return criteria and the role microeconomic theory.

Applications of Microeconomics in Investments and Portfolio Theory

The modern portfolio theory stresses reducing correlations between securities within the portfolio to minimize diversifiable risk. The plot of portfolio risk measured by its standard deviation of returns and the portfolio return lead to the derivation of the feasible portfolios and is discussed in the basic investment textbooks. An efficient frontier is developed from these attainable portfolios, which provides highest return for a given level of risk or lowest risk for a given level of return. Our earlier discussion on indifference curve and utility while revisiting the microeconomic theory guides us in portfolio selection process. Here, the indifference curves are the tangent points along the efficient frontier, which offer an investor the highest satisfaction or utility from a specific combination of risk and return to which an investor would be indifferent. In turn, it leads to a portfolio selection technique, namely determining your risk tolerance level and then utilizing correlation of returns between securities to select portfolios from different securities and industries which provide the highest returns for the desired level of risk.

CONCLUSION

In the business world, a finance manager must find solutions to business issues using financial tools regardless of which disciplines these techniques originate or taught in the academic world. If the pressing problem facing the manager requires using a menu of techniques or combining them to resolve the business issues, then he or she will apply it, and this approach to solving business problems is acceptable, provided these techniques are used in the right economic framework. In this study we have unraveled how microeconomics principles have been deployed in the financial discipline, resulting in the development of financial tools and techniques to solve business problems. We hope that students and practitioners will be able tie in a seamless manner and if necessary, modify these concepts to apply and solve business problems in a firm, and just like the microeconomic principles, the accounting and financial techniques may be extended to other disciplines to help solve business issues.

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