MANAGERIAL ECONOMICS COLLECTION

Managerial Economics

Concepts and Principles

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Abstract

Economic principles inform good business decision making. Although economics is sometimes dismissed as a discourse of practical relevance to only a relatively small circle of academicians and policy analysts who call themselves economists, sound economic reasoning benefits any manager of a business, whether they are involved with production and operations, marketing, finance, or corporate strategy. Along with enhancing decision making, the field of economics provides a common language and framework for comprehending and communicating phenomena that occur within a business, as well as between a business and its environment.

This text addresses the core of a subject commonly called managerial economics, which is the application of microeconomics to business decisions. Key relationships between price, quantity, cost, revenue, and profit for an individual firm are presented in the form of simple conceptual models. The text includes key elements from the economics of consumer demand and the economics of production. The book discusses economic motivations for expanding a business and contributions from economics for improved organization of large firms. Market price-quantity equilibrium, competitive behavior, and the role of market structure on market equilibrium and competition are addressed. Finally, the text considers market regulation in terms of the generic problems that create the need for regulation and possible remedies for those problems.

Although the academic literature of managerial economics often employs abstract mathematics and large corporations create and use sophisticated mathematical models that apply economics, this book focuses on concepts, terminology, and principles, with minimal use of mathematics. The reader will gain a better understanding of why businesses and markets function as they do and how those institutions can function better.

Keywords

economics of demand, economics of the firm, economics of organization, economics of production, economics of strategy, market regulation, market structure

Contents

CHAPTER 1

Introduction to Managerial Economics

What Is Managerial Economics?

One standard definition for economics is the study of the production, distribution, and consumption of goods and services. A second definition is the study of choice related to the allocation of scarce resources. The first definition indicates that economics includes any business, nonprofit organization, or administrative unit. The second definition establishes that economics is at the core of what managers of these organizations do.

This book presents economic concepts and principles from the perspective of "managerial economics," which is a subfield of economics that places special emphasis on the choice aspect in the second definition. The purpose of managerial economics is to provide economic terminology and reasoning for the improvement of managerial decisions.

Most readers will be familiar with two different conceptual approaches to the study of economics: microeconomics and macroeconomics. Microeconomics studies phenomena related to goods and services from the perspective of individual decision-making entities—that is, households and businesses. Macroeconomics approaches the same phenomena at an aggregate level, for example, the total consumption and production of a region. Microeconomics and macroeconomics each have their merits. The microeconomic approach is essential for understanding the behavior of atomic entities in an economy. However, understanding the systematic interaction of the many households and businesses would be too complex to derive from descriptions of the individual units. The macroeconomic approach provides measures and theories to understand the overall systematic behavior of an economy.

Since the purpose of managerial economics is to apply economics for the improvement of managerial decisions in an organization, most of the subject material in managerial economics has a microeconomic focus. However, since managers must consider the state of their environment in making decisions and the environment includes the overall economy, an understanding of how to interpret and forecast macroeconomic measures is useful in making managerial decisions.

Why Managerial Economics Is Relevant for Managers

In a civilized society, we rely on others in the society to produce and distribute nearly all the goods and services we need. However, the sources of those goods and services are usually not other individuals but organizations created for the explicit purpose of producing and distributing goods and services. Nearly every organization in our society—whether it is a business, nonprofit entity, or governmental unit—can be viewed as providing a set of goods, services, or both. The responsibility for overseeing and making decisions for these organizations is the role of executives and managers.

Most readers will readily acknowledge that the subject matter of economics applies to their organizations and to their roles as managers. However, some readers may question whether their own understanding of economics is essential, just as they may recognize that physical sciences like chemistry and physics are at work in their lives but have determined they can function successfully without a deep understanding of those subjects.

Whether or not the readers are skeptical about the need to study and understand economics per se, most will recognize the value of studying applied business disciplines like marketing, production/operations management, finance, and business strategy. These subjects form the core of the curriculum for most academic business and management programs, and most managers can readily describe their role in their organization in terms of one or more of these applied subjects. A careful examination of the literature for any of these subjects will reveal that economics provides key terminology and a theoretical foundation. Although we can apply techniques from marketing, production/operations management, and finance without understanding the underlying economics, anyone who wants to understand the why and how behind the technique needs to appreciate the economic rationale for the technique.

We live in a world with scarce resources, which is why economics is a practical science. We cannot have everything we want. Further, others want the same scarce resources we want. Organizations that provide goods and services will survive and thrive only if they meet the needs for which they were created and do so effectively. Since the organization's customers also have limited resources, they will not allocate their scarce resources to acquire something of little or no value. And even if the goods or services are of value, when another organization can meet the same need with a more favorable exchange for the customer, the customer will shift to the other supplier. Put another way, the organization must create value for their customers, which is the difference between what they acquire and what they produce. The thesis of this book is that those managers who understand economics have a competitive advantage in creating value.

Managerial Economics Is Applicable to Different Types of Organizations

In this book, the organization providing goods and services will often be called a "business" or a "firm," terms that connote a for-profit organization. And in some portions of the book, we discuss principles that presume the underlying goal of the organization is to create profit. However, managerial economics is relevant to nonprofit organizations and government agencies as well as conventional, for-profit businesses. Although the underlying objective may change based on the type of organization, all these organizational types exist for the purpose of creating goods or services for persons or other organizations.

Managerial economics also addresses another class of manager: the regulator. As we will discuss in the final chapter, the economic exchanges that result from organizations and persons trying to achieve their individual objectives may not result in the best overall pattern of exchange unless there is some regulatory guidance. Economics provides a framework for analyzing regulation, both the effect on decision making by the regulated entities and the policy decisions of the regulator.

The Focus of This Book

The intent of this book is to familiarize the reader with the key concepts, terminology, and principles from managerial economics. After reading the text, you should have a richer appreciation of your environment—your customers, your suppliers, your competitors, and your regulators. You will learn principles that should improve your intuition and your managerial decisions. You will also be able to communicate more effectively with your colleagues and with expert consultants.

As with much of microeconomic theory, many of the economic principles in this book were originally derived with the help of mathematics and abstract models based on logic and algebra. In this book, the focus is on the insights gained from these principles, not the derivation of the principles, so only a modest level of mathematics is employed here and an understanding of basic algebra will suffice. We will consider some key economic models of managerial decision making, but these will be presented either verbally, graphically, or with simple mathematical representations. For readers who are interested in a more rigorous treatment, the reference list at the conclusion of this text includes several books that will provide more detail. Alternatively, a web search using one of the terms from this book will generally yield several useful links for further exploration of a concept.

A note about economic models is that models are simplified representations of a real-world organization and its environment. Some aspects of the real-world setting are not addressed, and even those aspects that are addressed are simplifications of any actual setting being represented. The point of using models is not to match the actual setting in every detail, but to capture the essential aspects so determinations can be made quickly and with a modest cost. Models are effective when they help us understand the complex and uncertain environment and proceed to appropriate action.

How to Read This Book

Like any academic subject, economics can seem like an abstract pursuit that is of greatest interest to economists who want to communicate with other economists. However, while there is certainly a substantial body of

written research that may reinforce that impression, this book is written with the belief that economics provides a language and a perspective that is useful for general managers.

All readers have a considerable experience base with the phenomena that economics tries to address, as managers, consumers, or citizens interested in what is happening in their world and why. As you read the book, I encourage you to try to apply the concepts and theories to economic phenomena you have experienced. By doing so, the content of the book will make more sense and you are more likely to apply what you will read here in your future activities as a player in the world of business and economics.

CHAPTER 2

Key Measures and Relationships

A Simple Business Venture

In this chapter we will be covering some of the key measures and relationships of a business operation. To help illustrate these concepts, we will consider the following simple business venture opportunity.

Suppose three students like spending time at the beach. They have pondered whether they could work and live at the beach during their summer break and learned that they could lease a small building by the beach with existing freezer capacity and apply for a local license to sell ice cream bars.

Revenue, Cost, and Profit

Most businesses sell something—either a physical commodity like an ice cream bar or a service like a car repair. In a modern economy, that sale is made in return for money or at least is evaluated in monetary terms. The total monetary value of the goods or services sold is called *revenue.*

Few businesses are able to sell something without incurring expenses to make the sale possible. The collective expenses incurred to generate revenue over a period of time, expressed in terms of monetary value, are the *cost.* Some cost elements are related to the volume of sales; that is, as sales go up, the expenses go up. These costs are called *variable costs.* The cost of raw materials used to make an item of clothing would be an example of a variable cost. Other costs are largely invariant to the volume of sales, at least within a certain range of sales volumes. These costs are called *fixed costs.* The cost of a machine for cutting cloth to make an item of clothing would be a fixed cost.

Businesses are viable on a sustained basis only when the revenue generated by the business generally exceeds the cost incurred in operating the business. The difference between the revenue and cost (found by subtracting the cost from the revenue) is called the *profit*. When costs exceed revenue, there is a negative profit, or *loss*.

The students in our simple venture realize they need to determine whether they can make a profit from a summer ice cream bar business. They met the person who operated an ice cream bar business in this building the previous summer. He told them last summer he charged $1.50 per ice cream bar and sold 36,000 ice cream bars. He said the cost of the ice cream bars—wholesale purchase, delivery, storage, and so on—comes to about $0.30 per bar. He indicated his other main costs—leasing the building, license, local business association fee, and insurance—came to about $16,000.

Based on this limited information, the students could determine a rough estimate of the revenue, costs, and profit they would have if they were to repeat the outcomes for the prior operator. The revenue would be $1.50 per ice cream bar times 36,000 ice cream bars, or $54,000. The variable cost would be $0.30 per ice cream bar times 36,000 ice cream bars, or $10,800. The fixed cost would be $16,000, making the total cost $26,800. The profit would be $54,000 minus $26,800, or $27,200.

Based on this analysis, the students are confident the summer business venture can make money. They approach the owner of the building and learn that if they want to reserve the right of first option to lease the building over the summer, they will need to make a nonrefundable $6000 deposit that will be applied to the lease. They proceeded to make that deposit.

A few weeks later, all three students were unexpectedly offered summer business internships at a large corporation. Each student would earn $10,000. However, the work site for the internships is far from the beach and they would be in an office all day. They now must decide whether to accept the internships and terminate their plan to run a business at the beach or turn down the internships.

Economic Versus Accounting Measures of Cost and Profit

The discipline of accounting provides guidelines for the measurement of revenue, cost, and profit. Having analyses based on generally accepted principles is important for making exchanges in our economy. For example, corporations must produce financial statements to help investors and creditors assess the health of the corporation. Individuals and businesses must produce tax returns to determine a fair measurement of income for taxation purposes.

Costs as measured according to accounting principles are not necessarily the relevant measurements for decisions related to operating or acquiring a business. For example, accounting standards dictate that businesses depreciate long-lived assets, like buildings, by spreading the cost over the life of the asset.[1] However, from the perspective of the business, the entire expense was incurred when the asset was acquired, even if borrowing was necessary to make the purchase and there will be the opportunity to take increased tax deductions in future years.

Likewise, there are other business costs relevant to decision making that may not be considered as costs from the perspective of accounting standards. For example, the owner/operator of a proprietorship invests time and effort in operating a business. These would typically not be treated as expenses on the proprietorship's tax return but are certainly relevant to the owner in deciding how to manage his self-run business.

Based on these differences in perspective, it is useful to distinguish *accounting costs* from *economic costs*. In turn, since profit is the residue of revenue minus costs, we also distinguish *accounting profit* from *economic profit*.

Consider our three students who are now in a quandary about whether to sell ice cream bars on the beach or accept the summer internships, and let us see how distinguishing the economic cost/profit from the accounting cost/profit helps to clarify their decision.

There is the matter of the students' time and energy, which is not reflected in the projection of the $27,200 profit based on last year's operation. One way to measure that cost is based on how much they will forfeit by not using their time in the next best alternative, which in this case is the summer internship. We can consider this forfeited income as being equivalent to a charge against the operation of the ice cream business, a

measurement commonly referred to as an *opportunity cost.* The students' time has an opportunity cost of $30,000. This should be added to the earlier fixed cost of $16,000, making an economic fixed cost of $46,000, a total economic cost of $56,800, and an economic loss of $2800. So maybe the ice cream business would not be a good idea after all.

However, recall that the students have already made a $6000 nonrefundable deposit. This money is spent whether the students proceed to run the summer business or not. It is an example of what is called a *sunk cost.* Assuming the fixed cost of the business was the same as for the prior operator, the students would have a $16,000 accounting fixed cost to report on a tax return. Yet, from the perspective of economic costs, only $10,000 is really still avoidable by not operating the business. The remaining $6000 is gone regardless of what the students decide. So, from an economic cost/profit perspective, viewed after the nonrefundable deposit but before the students declined the summer internships, if the students' other costs and revenue were identical to the previous year, they would have economic costs of just $50,800 and an economic profit of $3200.

If a business properly measures costs from an economic perspective, ignoring sunk costs and including opportunity costs, you can conclude that *a venture is worth pursuing if it results in an economic profit of zero or better.* However, this is generally not a valid principle if you measure performance in terms of accounting profit. Most stockholders in a corporation would not be satisfied if the corporation only managed a zero accounting profit because this means there is no residual from the business to reward them with either dividends or increased stock value. From an economic cost perspective, stockholder capital is an asset that can be redeployed, and thus it has an opportunity cost—namely, what the investor could earn elsewhere with their share of the corporation in a different investment of equivalent risk.[2] This opportunity cost could be estimated and included in the economic cost. If the resulting profit is zero or positive after netting out the opportunity cost of capital, the investor's participation is worthwhile.

Revenue, Cost, and Profit Functions

In the preceding projections for the proposed ice cream bar venture, the assumption was that 36,000 ice cream bars would be sold based on the volume in the prior summer. However, the actual volume for a future

venture might be higher or lower. And with an economic profit so close to zero, our students should consider the impact of any such differences.

There is a relationship between the volume or quantity created and sold and the resulting impact on revenue, cost, and profit. These relationships are called the revenue function, cost function, and profit function. These relationships can be expressed in terms of tables, graphs, or algebraic equations.

In a case where a business sells one kind of product or service, revenue is the product of the price per unit times the number of units sold. If we assume ice cream bars will be sold for $1.50 apiece, the equation for the revenue function will be

$$R = \$1.5\ Q,$$

where R is the revenue and Q is the number of units sold.

The cost function for the ice cream bar venture has two components: the fixed cost component of $40,000 that remains the same regardless of the volume of units and the variable cost component of $0.30 times the number of items. The equation for the cost function is

$$C = \$40{,}000 + \$0.3\ Q,$$

where C is the total cost. Note we are measuring economic cost, not accounting cost.

Since profit is the difference between revenue and cost, the profit functions will be

$$\pi = R - C = \$1.2\ Q - \$40{,}000.$$

Here π is used as the symbol for profit. (The letter P is reserved for use later as a symbol for price.)

Table 2.1 provides actual values for revenue, cost, and profit for selected values of the volume quantity Q. Figure 2.1 provides graphs of the revenue, cost, and profit functions.

The average cost is another interesting measure to track. This is calculated by dividing the total cost by the quantity. The relationship between average cost and quantity is the *average cost function*. For the ice cream bar venture, the equation for this function would be

$$AC = C/Q = (\$40{,}000 + \$0.3\ Q)/Q = \$0.3 + \$40{,}000/Q.$$

Figure 2.2 shows a graph of the average cost function. Note that the average cost function starts out very high but drops quickly and levels off.

Table 2.1. Revenue, Cost, and Profit for Selected Sales Volumes for Ice Cream Bar Venture

Units	Revenue	Cost	Profit
0	$0	$40,000	–$40,000
10,000	$15,000	$43,000	–$28,000
20,000	$30,000	$46,000	–$16,000
30,000	$45,000	$49,000	–$4,000
40,000	$60,000	$52,000	$8,000
50,000	$75,000	$55,000	$20,000
60,000	$90,000	$58,000	$32,000

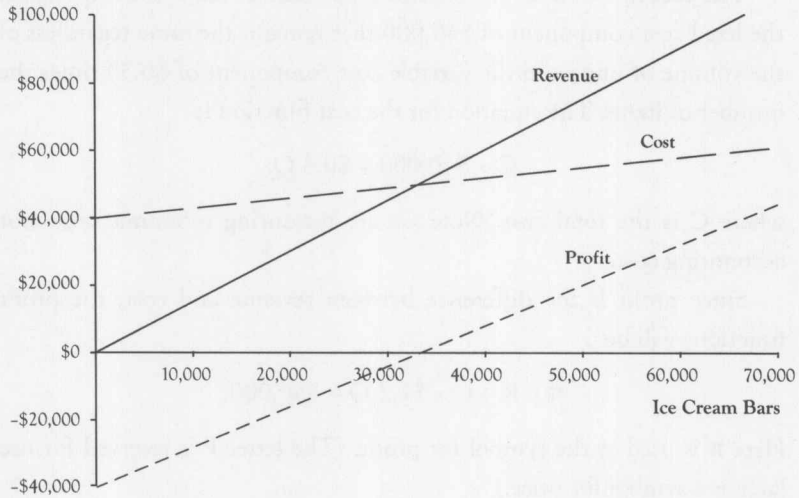

Figure 2.1. Graphs of revenue, cost, and profit functions for ice cream bar business at price of $1.50.

Essentially the average cost function is the variable cost per unit of $0.30 plus a portion of the fixed cost allocated across all units. For low volumes, there are few units to spread the fixed cost, so the average cost is very high. However, as the volume gets large, the fixed cost impact on average cost becomes small and is dominated by the variable cost component.