1 MODERN VALUE QUANDARIES

THE FIRM IN ECONOMICS AND FINANCE

For at least two millennia, private businesses have been undertaken by farmers, traders, and artisans across the globe. Such businesses—including small farms, fishing and herding enterprises, textile and clothing producers, and larger ventures—have been the world's primary employers and wealth producers for centuries. Furthermore, for at least the past two centuries society has benefited from the formal study of economics, accounting, and the precursors of finance. What we call a business, enterprise, undertaking, or "firm" figures prominently in all of these fields. Yet with all of this scholarship, we really know very little about the definition and value of the firm. Addressing this poverty is the prime motivation of this book.

For graduates and holders of professional credentials in the fields of accounting, finance, economics, and business, this bold assertion of our lack of knowledge may seem overwrought. However, in this chapter, we pose several quandaries that illustrate this poverty. If we really had a complete, coherent, and valid theory of the firm and its value, these quandaries would not exist. The fact that they *do* exist, and that similar serious self-contradictions exist in related fields of study, motivates this book.

TWO MILLENNIA OF BUSINESS: A BRIEF RECAP

Business from 500 BC to AD 1500

Two millennia ago, accounts of business activity and rules for business behavior appeared in ancient texts such as the books of the Old Testament of the Bible (including the books of the Torah), the books of the New Testament, the Vedas of Hindu literature, and ancient legal codes such as those of the Roman Empire and the Babylonian empire of Hammurabi.[1]

During these twenty centuries, agriculture, hunting, fishing, and herding of game animals were the primary occupations. These farmers, hunters, fishermen, and herders were all engaged in business, and the prospect of hunger and famine made their business very important indeed.

For roughly the last thousand years, the emerging civilizations of the world benefited from mathematics, customs of trade, and other knowledge recorded in Greek and Roman literature, as well as lesser-known literature from other lands. Critical scientific advances that occurred in Egypt, China, India, and the Near East—including the creation of the number system we use today, as well as basic algebra—were transmitted to the West, sometimes with the actual origins forgotten. Much of this knowledge was directly used in business and trade, including weights and measures, arithmetic and numbering, geometry, timekeeping, navigation, water distribution, and cultivation.

Of course, such knowledge was not nicely recorded and widely distributed. Human and civil rights, such as the right to property and the fruits of one's own labor, were denied to many. Life expectancy, literacy, and the need for subsistence were such that relatively few people received a formal education as we now understand it. However, businesses were organized, grew, and failed; trade flourished, was interrupted, and then resumed; people received wages for their work and paid for their purchases; wars and pestilence came and went; and somehow civilization survived—and with it, the institution of business survived and grew.

Business Since AD 1500

In the last five hundred years, business practices were further developed, as were a number of related fields of study, particularly the following:

1500s

- Traders and other businesspeople developed a formal system of accounting to record transactions within a firm. Such practices allowed commerce to grow and are still the bases for trade, contracts, and business investment.

1700s & 1800s

- Economists began writing about the economies of modern societies. Classical economists such as Adam Smith and David Ricardo proposed an explicit labor theory of value.

1900s

- Neoclassical economics emerged as a dominant influence in the whole of social science. It introduced the concepts of marginal cost, consumer utility, and profit maximization, which are now used in economics, law, government, sociology, and commerce. The pervasive idea that prices are set when supply meets demand in an open market took hold.

1940s

- A school of modern finance emerged as a separate discipline. Building on both neoclassical microeconomics and mathematics, modern finance developed notions of arbitrage, martingale pricing, portfolio choice, and mean-variance analysis.

1950s

- Formal credentials were developed for professionals engaged in selling securities of firms, providing advice for individuals investing in firms, accounting or auditing the accounts of firms, and appraising business property. The Modigliani-Miller proposition emerged as a pillar of modern finance. The basis for modern portfolio theory was established.

1970s–2010

- A specialized professional literature in the valuation of business developed. Alongside it grew a smaller literature for forensic economists, who estimate the change in value of firms for the purpose of estimating damages to businesses caused by breaches of contract and natural disasters. A formula for the valuation of certain financial options became widely available. Financial engineering and discounted cash flow analysis became ubiquitous.

We must acknowledge this tremendous progress in the fields of economics, finance, and accounting, and the ongoing efforts of scholars and professional societies dealing with businesses and business value. Indeed, we will devote several chapters to doing exactly that!

THE QUANDARIES

With all this knowledge, we should have a very well-developed theory of the firm and a very well-developed theory of the value of a firm. These theories should be amply tested by reality, comprehensive, and internally consistent.

Unfortunately, few theories provide a sound basis for determining the market value of a privately held firm. Moreover, we still have large gaps in our knowledge about the *rationale* of firms in the modern economy, and no workable universal definition of the firm. Notions of the firm used in microeconomics, accounting, corporate finance, and option pricing all differ. Finally, professionals who seek practical guidance on the definition and value of a firm routinely find it—at least in the United States—from an unlikely source for intellectual enlightenment: the federal taxation authorities.

This unsatisfactory state of affairs can be illustrated by the seven quandaries posed next. Each illustrates a significant gap in the orthodox theories of business drawn from economics, finance, and accounting.

Quandary 1: Mainstream Economics Ignores the Firm

The Neglect of the Firm in Economics

This quandary dates back to the creation of the mathematical models that form the basis of general equilibrium economics. Consider this statement by Léon Walras, the pioneer of welfare economics, writing in the nineteenth century:

> Once the equilibrium has been established in principle, exchange can take place immediately. Production, however, requires a certain lapse of time. We shall resolve the

> second difficulty purely and simply by ignoring the time element at this point. (Walras, 1874, p. 242)

Walras developed the early model of exchange equilibrium, meaning that the buyers and sellers in a market reach agreements at market-clearing prices. However, in order to do this he had to ignore the fact that *production* took some time. It is the firm (or set of firms) that directly internalizes the time, cost, and uncertainty of production. Walras dealt with important issues in economics, and his thought is the basis for much of what we call microeconomics today. But he explicitly ignored the inner workings of the firm. In essence, the firm vanishes from the theoretical model of production, exchange, and consumption.

Next we quote an influential modern-era microeconomist:

> The firm fits into general equilibrium theory as a balloon fits into an envelope: flattened out! Try with a blown-up balloon: the envelope may tear, or fly away: at best, it will be hard to seal and impossible to mail. . . . Instead, burst the balloon flat, and everything becomes easy. Similarly with the firm and general equilibrium—though the analogy requires a word of explanation.
>
> Jacques H. Drèze, "Uncertainty and the Firm in General Equilibrium Theory," *Economic Journal*, 1985, p. 1.[2]

These observations about the state of economic science are telling.[3] In more than a hundred years, economics had moved quite far—but still typically viewed the firm as a "flattened balloon" abstraction. A few decades later, the standard presentation of the firm in both microeconomics and macroeconomics remains quite primitive.

In the standard microeconomics model, firms are typically assumed to sell homogenous goods using a simple production function. Workers adjust their consumption according to their wages and interest rates. To the extent that firms' production plans are even considered, they are often presented as solutions to single-period profit maximization problems, or as the intersections of average cost curves, assuming static production technology and market structure. Entrepreneurial interests, uncertainty, institutional factors, and numerous financial, managerial, and practical considerations in the organization and operation of the firm are largely assumed away.[4]

To be sure, even this primitive specification of the firm leaves plenty of room for issues such as monetary policy, fiscal policy, trade policy, labor policy, regulation of markets with oligopoly structures, causes of business cycles, and so on. However, it also leaves a rather large void.

The Fulsome Importance of the Firm in the Real Economy

Consider the dimensions in which the firm has an essential, if not dominant, role in society:

- Most firms in the United States are "small" and privately held. Furthermore, these firms appear to employ most of the private-sector workers in the country.
- Equity interests in firms appear to be a very large portion of household wealth.[5]
- One cannot endure an election cycle—at least in the United States—without some businesses, or entire industries being pilloried in campaign rhetoric.[6]

- Much of popular media, entertainment, and sporting events are financed by advertising by firms.[7]
- Successful entrepreneurs have often used their riches to create or endow important charitable, cultural, and educational institutions.[8]
- Finally, a significant portion of the tax revenue of most state and national governments consists of taxes imposed on, or collected by, firms.[9]

The firm is relegated to such inferior status in economics, but not because it is an inferior part of the economy.

Quandary 2: Mainstream Economics Ignores the Entrepreneur

The Much-Loved, but Ignored, Entrepreneur

To understand business value, we must recognize the motivations of those who create businesses and run them. However, neoclassical economics—the dominant school within economics for the past century—largely ignores such people. We discussed earlier how neoclassical economics ignores the inner workings of firms; the entrepreneur can be seen as the inner-inner working of all firms. The relegation of entrepreneurs to an abstraction within neoclassical economics means that these inner workings—so critical to the understanding of business creation, destruction, and value—are also abstracted away. Outside microeconomics, the entrepreneur enjoys a much better public reputation.

Although the notion of the "greedy business executive" is a staple of movies and television shows, the entrepreneur is usually shown in a more favorable light. A good part of popular culture appears to accept the notion that entrepreneurs typically focus on much more than money during their (often long and sometimes unsuccessful) efforts.

Perhaps the most influential modern philosopher of entrepreneurship is George Gilder, whose 1981 book *Wealth and Poverty* became a best-seller and something of a touchstone of the presidency of Ronald Reagan.[10] Gilder writes of the entrepreneur's desire to create, to give, even to love.[11]

This idea of the entrepreneur actually goes back centuries. The Irish economist Richard Cantillon described the entrepreneur as a risk-bearer in the eighteenth century, before Adam Smith wrote his *Wealth of Nations*.[12] Among classic economists, John Stuart Mill and others recognized the vital role of the entrepreneur.

The great twentieth-century economist Joseph Schumpeter coined a phrase that should resonate with anyone who ever worked to build a business, or rebuild it, or expand it. The term is *creative destruction*:

> The opening up of new markets, foreign or domestic, and the organizational development from the craft shop and factory to such concerns as U.S. Steel illustrate the same process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure *from within*, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism.
>
> Every piece of business strategy acquires its true significance only against the background of that process and within the situation created by it. It must be seen in its role in the perennial gale of creative destruction; it cannot be understood irrespective of it or, in

fact, on the hypothesis that there is a perennial lull. (Schumpeter, 1975, pp. 83–84; emphasis in original)[13]

Modern Brush-Asides

However prescient Gilder, Cantillon, and Schumpeter's ideas about entrepreneurship may have been, they were not adopted by the mainstream of the economics profession. The importance of entrepreneurship in the dominant economics paradigm diminished greatly in the twentieth century and is still largely missing from general equilibrium economic theory. Some reasons for this disappearance are as follows:

- The neoclassical model relies on equilibrium in a nearly perfect market.[14] This leaves little room for the risk-taking and judgment (not to mention animal spirits) that are the lifeblood of the true entrepreneur.[15]
- The reliance on (some would say infatuation with) mathematical models in modern economics requires much abstraction. Such abstraction cuts against the inclusion of complicated—and mathematically messy—factors such as transaction costs, barriers to entry, uncertainty, and limited ability to finance, all of which are ubiquitous concerns of the entrepreneur.
- A cultural bias exists against "boot strappers" among the well-credentialed academics who write most economics and finance textbooks. This is probably due to a predictable sympathy toward the traditions, mores, and work habits common where one lives and works, and the large differences between the typical life experiences of professors and entrepreneurs.[16]
- There are readily available data on very large, publicly traded firms—providing a convenient basis for academic research and publication opportunities—but relatively little data on privately held firms.[17]

Quandary 3: Entrepreneurs Do Not Maximize Profits

The Profit Maximization Principle

The behavior of entrepreneurs—what they seek, how they think, what they do—should be a core concept in microeconomics. After all, it is entrepreneurs who start businesses. Without them, there are no businesses. What do entrepreneurs try to do?

This question has an easy answer within the world of economics and finance: they maximize profits. Indeed, the idea of businesspeople as mindless profit-maximizers is invoked by politicians, the news media, and popular books and movies.[18] In addition to its elevated position in popular culture, this notion is deeply embedded in the dominant tradition of economics, the neoclassical school.[19] Indeed, we will find that both the traditional neoclassical model and a modern revision of that model assume that the objective of the firm is to "maximize profits."

Entrepreneurs Versus the Economics Books

Of course, the real world is messier than any model. However, I argue the neoclassical model of entrepreneurial behavior is not just incomplete; *it is wrong.*

In particular, entrepreneurs *do not maximize profits*. They *like* profits; they work to *increase* profits at some point; but they do not, as a rule, try to *maximize* them in any one period.

How can this heresy be stated so confidently? It is not heresy to an entrepreneur; it is commonplace. An entrepreneur who attempts to profit-maximize in any one period (say, the first year of business, or the second) will probably find that the optimal "profit-maximizing" production is zero. In other words, shutting down the fledgling firm is what the economics book says he or she ought to do.

Fortunately for all of us, entrepreneurs often refuse to follow the book.

In Chapter 15, "The Value Functional: Theory," we will outline a different objective function of the firm: to maximize *value*. This is *not* the same as maximizing profits in any one period, or every period, or even maximizing the net present value of future expected profits. Instead, it matches what we know about how entrepreneurs actually think and what we can observe about how they act.

Quandary 4: Net Present Value Is Not Value

Much of finance is based on the principle that the value of a firm, and the value of investments in a firm, is defined by the net present value (NPV) of the firm's expected future earnings. The "NPV equals value" principle is embedded deeply in finance. Later in this book, we will date its adoption to the publication and widespread acceptance of the Modigliani-Miller (M-M) propositions approximately a half century ago.[20] However, as a general rule, the net present value of expected future cash flows is *not* the market value of an investment and is rarely the market value of a business.

In Chapter 3, "The Failure of the Neoclassical Investment Rule," we describe several reasons why this is so, including the lack of information from which to estimate net present value (or expected net present value); the ignorance of options, such as the option to wait; and the lack of attention to policy and strategy. Although an entire generation of finance scholars has toyed with the assumptions and implications of the M-M theorem, few have questioned its premise. It is time to do so.

Quandary 5: Managers Do Not Follow the Neoclassical Investment Rule

An important corollary to the "NPV equals value" principle is the *neoclassical investment rule*: a firm should invest in a project when the expected discounted earnings from the investment, less the cost of making the investment, are positive. This is, again, a pillar of modern finance. It is stated and restated in textbooks, magazine articles, journal articles; it is embedded in spreadsheets and models.

However, because NPV is *not* value, the pillar is unstable. In many cases, the neoclassical investment rule leads to the *wrong* decision for the firm, even when the firm's managers have excellent information. By *wrong*, I do not mean merely suboptimal; I mean following the rule causes decisions that *lose money* in amounts that exceed the cost of using a better decision rule. This is, after all, the acid test of a rule.[21]

Of course, the ubiquitous discounted cash flow tables that are taught in standard finance classes are also used in the real business world. Does this mean real managers *follow the rule* when they invest in real life?

In fact, the answer is "only sometimes." Real managers frequently use their judgment to select or reject investments regardless of whether the calculated net present value meets the supposed criteria. Their judgment—not any net present value calculation—is typically the actual determinant.

We will survey extensive empirical evidence on this point in Chapter 3, "The Failure of the Neoclassical Investment Rule." However, we also have the testimony of an unassailable authority on this very question: Stewart Myers. Among other accomplishments, Myers is the co-author (with Richard Brealey) of a widely sold text on corporate finance, which has now been used in various editions by an entire generation of business school students.[22] His decades of experience with actual investment led him and his co-author to coin a "law" of investor behavior:

> According to Brealey and Myers's Second Law, "The proportion of proposed projects having positive NPV is independent of top management's estimate of the opportunity cost of capital."[23]

Real decisions are usually *informed by DCF*, but not *made by DCF*. This means that those who really matter have decided, though perhaps not admitted, that it is not a very good decision rule.

Quandary 6: There Is No Single Coherent Theory of Business Value

The contemporary reader can choose among shelves full of books on valuation methods, odes to the virtues of shareholder value, and strategies to enhance value, however defined. He or she can spend a short career studying mathematical finance models, or learning accounting and finance formulas, or buying and selling investment securities.

That same reader would find no single, valid, coherent theory of business valuation. Yes, we have the intricate mathematics of risk-neutral valuation; we have accounting pronouncements and standards; we have neat formulations for the growth of cash flow and other "value drivers"; and we have the venerable neoclassical investment rule. *None* of these offers a coherent theory of business value.

The most prominent candidate for a coherent theory of business value is Franco Modigliani and Merton Miller's assumption that "the value of a business equals the expected net present value of its profits." This is a cornerstone of capital budgeting theory. Unfortunately, it is incorrect—and, as noted previously, savvy managers often do not follow it anyway.

Quandary 7: Distant and Separate Literatures Cover Business Value Theory

Finance and Economics Literatures Post-1965

There is another consequence—and partially a cause—of this lack of a coherent business value theory. It is the existence of at least two literatures on valuation, almost completely distinct, and often distant from each other:[24]

1. *Finance, accounting, and business management literature.* The concepts of market value and accounting (book) value play a prominent role here, as do management decisions to enhance market value. These books and articles are often heavy on cash flow statements,

finance formulas, and business school jargon. The concept of income alone, for example, is subjected to multiple gradations derived from accounting conventions (gross profit, net profit, operating profit, net operating profit less adjusted taxes [NOPLAT], earnings before interest and taxes [EBIT], earnings before interest, taxes, depreciation, and amortization [EBITDA], "cash flow to the firm," "cash flow to equity," etc.). The value premise is nearly always the net present value rule, with some recent exceptions involving options. Very little attention is paid to underlying economic causes of growth, and any mathematics underlying the valuation premise is often summarized, omitted, or left to appendices.[25]

The capital asset pricing model (CAPM) usually makes an appearance, along with other portfolio-based asset pricing models. However, these are used to describe how investors generally choose assets in a stock market and to estimate discount rates.[26]

2. *The economics and mathematical finance literature.* Entire books within this genre are published without the inclusion of a single accounting statement.[27] Concepts such as "income" and "cash flow" are commonly stated tersely and encapsulated into only one or two variables.

Extensive mathematics (including, in recent decades, set and measure theory, stochastic calculus, and differential calculus) are employed to derive theoretical models. The valuation premise is commonly a pricing-by-arbitrage algorithm or a mathematically sophisticated net present value rule. (In the case of risk-neutral valuation in perfect markets, these are two sides of the same coin.) In recent years, this literature has begun to recognize options, although the pricing techniques discussed are typically variations on the Black-Scholes formula and assume complete markets.

Spending some time in both camps, one is struck by the fact that they are almost entirely separate. Of course, there are exceptions, but contemporary authors in one camp rarely cite those in the other camp and often appear to be unaware of the issues that confront the others.[28] The one stream of literature—and it is a very narrow one—where there is extensive cross-pollination is the valuation and damages texts written by forensic or business economists, which must live in both worlds.[29]

Weakness Within the Stronghold

One may be tempted to dismiss the preceding observations as merely the recognition of the frontiers of research and remain confident that the last half century of modern finance has produced a satisfactory state of affairs. Perhaps it has done so in the classroom but not in the marketplace for business equity.

Even within a fairly narrow subset of finance—the proper portfolio selection for investors with significant investable funds—there is a serious weakness in theory and practice. In particular, the mean-variance framework and its progeny (including the CAPM, arbitrage pricing theory [APT], and their many variations) do not suffice even for portfolio investors.[30] There is no doubting the contributions of the pioneers of the 1950s and 1960s, but there is also no concealing the work that is not yet done.

I was struck by a remark made quite recently by William Sharpe, one of those pioneers in the 1960s. He described the current situation as "not an entirely happy state of affairs."[31]

Although Sharpe was confining his remarks to investment advice largely involving publicly traded securities, his dissatisfaction in this area—the most thoroughly drilled in all finance—indicates an underlying weakness in our knowledge.

A Related Quandary: Intellectuals Seek Advice . . . from the Internal Revenue Service

There is one point on which academics, workers, and ordinary citizens would all agree: politicians who create tax laws are neither oracles of knowledge nor arbiters of fairness.

As a rule, experts in accounting, economics, and finance do not consider "taxable income" as defined by government taxation authorities a reliable indication of the actual earnings of the firm. Publicly traded companies in the United States and many other countries are required to disclose certain financial metrics to the investing public—but those disclosures are typically done according to generally accepted accounting principles, not tax-reporting rules.

Yet when defining a "business" and listing the considerations necessary to estimate its value, experts in these fields often rely on standards promulgated by the taxing authorities. In the United States, the Internal Revenue Service (IRS), or the Internal Revenue Code, is often the most respected authority on such elemental topics such as the standard of value (the definition of *fair market value* in the Internal Revenue Code), the information that must be used to estimate the value of a firm (IRS Revenue Ruling 59-60), types of businesses (Internal Revenue Code definitions of *partnership*, *corporation*, and *sole proprietorship*), and financial data (IRS Statistics of Income data).

When the taxing authorities are also the *intellectual* authorities, the intellectuals should be asking themselves some pointed questions.

ELEMENTS OF A NEW MODEL OF THE FIRM AND ITS VALUE

Modigliani and Miller, who established the concept of business value that has dominated for fifty years, did not proclaim it anything other than a first approximation.[32] This first approximation has lasted for half a century, and it is time to get a second one.

A new valuation approach would ideally incorporate multiple factors that are missing, improperly ignored, or assumed away in the current models. Thus, we would ideally develop a model that would do all of the following:

1. *Establish a definition of the "firm."* Such a definition must distinguish a firm from a worker who pays business taxes (as do many contractors) as well as distinguish a firm from a portfolio of stocks and bonds.

2. *Be informed by empirical data on most firms.* Empirical data on securities issued by publicly traded corporations form the basis for the most empirical work in finance. However, as demonstrated later in this book, more than 99 percent of the firms in the United States are privately held firms that do not issue such securities.

3. *Incorporate risk of the type faced by actual business owners.* Most businesses face very high risks in the first several years of their existence—risks that result in approximately half of

those firms disappearing. Even firms that survive their early years often face a handful of large risks. Such risks are not properly represented by the normal distribution that is often used as the basis for theoretical work in finance.

4. *Assume incomplete markets in equity and debt shares.* Incomplete markets are the rule—not the exception—for private firms.[33] Because complete markets are essential for the "no arbitrage" assumption to be valid, accepting the fact of incomplete markets means accepting the fact that many complete-market pricing methods will not work.

5. *Explicitly identify an objective function for the firm or the entrepreneur.* Identifying an objective function involves replacing the reflexive profit-maximization assumption and changing the implicit time horizon for entrepreneurs. Since most business owners face limitations in trading their equity shares, the one-period neoclassical economics model is untenable as the basis for an objective function for the firm. Similarly untenable is the two-period model underlying modern portfolio theory (MPT).

6. *Take into account factors that are missing in the standard discounted cash flow model.* These would include strategy, policy, and reputation; ideally, the existence of asymmetric information and agency would also be recognized.

7. *Incorporate the benefits of both operating income and real options into the valuation framework.* Actual managers and investors consider both factors.

Each of these objectives is discussed explicitly in one or more of the chapters in this book.[34] We propose a valuation framework that accomplishes most of these objectives, within an integrated model, in Chapter 15, "The Value Functional: Theory."