CHAPTER 1

Dynamic Decision Making

We are what we repeatedly do. Excellence, then, is not an act but a habit.

—Aristotle

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Completion of the first transcontinental railroad across the United States, ably told by Steven Ambrose, is a story of a very imperfect success, with numerous changes in how, where, and by whom the railroad was built. While imperfect, the railroad's completion is also a study in the flexibility of decision making where the paradigm of how, where, and by whom was always modified to fit the realities of building the road. Choices were constantly made and then modified on issues of where the track would go, how it would be financed, the construction, and, not to be overlooked, what political strings were to be pulled to get the railroad finished at a profit. Other than completing the railroad, there was not a set of proscribed rules; instead, a framework for decision making was set up, modified with new information, the choices were made and a new model put in place.

Successful decision making is a process, not an event, with constant modifications and interactions among the moving parts that evolve over time. In sports, many franchises win a championship once in a while. Yet repeat championships are driven by a model of decision making that generates winners.[1] The focus remains on the correct process that can be replicated over time and across circumstances rather than on a one-off correct decision that is more a matter of luck than skill. Good decision making must be replicable.

How do we go about seeking the correct process rather than the one-time correct decision? First, in economics, a framework must be developed that accurately characterizes the driving forces about the market we are

concerned with for our decision. This framework is both a filter and a structure around which we develop our decision making. The framework is a filter because it identifies the relevant information needed to address the problem. Not all facts are equally relevant. In decision making, for example, two biases can throw off the building of any framework. First, the recency bias is the temptation to take the most recent data and treat that as the critical input to any framework. Recent data is often the most readily available and often the impetus, especially if unanticipated, for an examination of operations. But recent data may also be the most distorted by other factors, such as weather, and, while easily available, may be just too convenient to the lazy researcher in search of easy answers.

Confirmation bias is a second source of problems for any model/framework builder. In this case, when decision makers are in the early stage of model development there is a tendency to grasp at models or data that confirm the initial prejudices of the researcher. Yet we know from watching mystery thrillers that the initial suspect is often not the real criminal. The same initial problem/phenomenon can be framed or interpreted differently in several ways and the great detective—as opposed to the hapless detective—chooses a framework that stands up to the evidence as it develops over time rather than as it is initially presented.

Successful framework development does not attempt to force problems into conceptual boxes supplied by post-secondary education. Too often, newly minted managers are too anxious to put well-learned tools to work even if the problem itself is not carefully defined. In laymen's terms, the rookie wishes to use a hammer to solve every problem, because he knows how to use a hammer, even when the solution calls for a screwdriver.

Assumptions are another problem for framework development. There is a delicate balance between assumptions that simplify a problem too much and assumptions that introduce false premises that constrain or even prevent a solution. We can simplify a problem too much in those cases where we essentially assume away a problem that comes back later to destroy us. Over the last three years, the assumption of liquidity and marketability was taken as gospel in a marketplace where neither was present to support the underlying asset prices when the system was shocked. Alternatively, certain assumptions can complicate or misrepresent the problem. In their classic book, Neustadt and May[2] make the case for a careful use of analogies in developing proper frameworks/models of the problem at hand rather than misrepresenting the problem as something similar to what we are comfortably familiar with. Finally, there is often an assumption of symmetry in our frameworks that simply is not there in real life—especially in finance. There are often few limits on the upside for profitable companies or investment strategies, but there are limits on the downside—bankruptcy. For

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state and local governments there are budget and liquidity constraints that limit the ability of decision makers to adopt certain financial strategies and risky options.

Education propels us forward on a body of accepted wisdom within a particular view of the world. This wisdom includes a traditional set of axioms or rules along with accepted problem-solving techniques that are consistent with the received wisdom. Our education provides the accepted theory and the accepted problem-solving techniques. However, once outside the bounds of traditional models, how do we discover a way to approach the new problems of the Great Recession, for example? The model solutions we have learned are seldom open-ended; they do not allow the practitioner room to solve new problems that are significantly different from the received wisdom. Often, unfortunately, the models and problems we are educated about reflect a tradition born of a very specific learning style that limits progress in learning. This was famously demonstrated in the case of Isaac Newton, who had to overcome the orthodox Cartesian limits of the English universities of his time to develop his insight into the workings of gravity. In our traditional educational systems, the study of problem-solving models prepares us for membership in the business/government leadership community in which we will later practice, but not necessarily stretch, the boundaries of that knowledge throughout our professional careers.

A problem-solving framework reflects the accepted model or pattern for pursuing a particular solution based on our education, but is not necessarily appropriate for the new set of problems we will face later in our careers. Traditional approaches to learning match existing facts with established theory. The focus here is to develop an approach that recognizes the constant evolution of the model itself as the facts of the economic environment change, and highlights the need for leaders to recognize change and make choices in a very dynamic world. The established models can proceed without change only so long as leaders accept without question the particular problem-solving methods and solutions already achieved—but this approach is not acceptable for effective decision making over time.

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PROBLEMS CHANGE—WHY NOT SOLUTIONS?

Our models of how the world works are often cast in concrete more often in our minds than in the real world. We give lip service to the argument that change is constant, but then build business models that are resistant to change. In his book, *Leading Change*, James O'Toole identifies a culture at General Motors that was unable to recognize the implications of change in the competitive environment and the breakdown of their business model.[3]

Our world poses problems of endless variety. There are two aspects of problem variation. First, each problem we confront is not representative of all problems we face. In our education, we are often given a method for addressing a type of problem which is, of course, very useful. Unfortunately, we tend to use the methods taught to us more broadly than is appropriate. We fit problems to the methods of solution with which we are intellectually comfortable. Further, we tend to look for the set of problems where our model solutions are useful and fail to recognize the possible class of problems that are too difficult to solve given our familiar models. Problems that are highly unlikely cannot be ignored. Many states of nature are possible, so that, to our chagrin, zero probability events show up more often than we expect. This is the fat tail problem or the 100-year flood that shows up more often than once every 100 years.

Another dynamic characteristic of problems is that they are not solved for all time—they morph and generate new problems. In fact, we often find that decisions to address one problem generate a response from society and/or our business competitors that lead to further change along the way. We see this in the pricing wars that often accompany gas station or retail competition in America.

In recent years we have witnessed a decline in information costs and accelerated adaptability to innovation by both businesses and consumers. This has shortened the life span of our solutions to problems and prompted new solutions more rapidly than many decision leaders had anticipated. Moreover, growth is not simply a function of labor, capital, and the growth of the stock of knowledge and technology. Growth and change are driven by the interaction of these factors as well as the disasters along the way. The technology of the Internet and the laptop computer had existed for some time, but in the mid-1990s the scale of these activities and their interaction generated a leap in personal productivity and innovation in software, pushing the growth in economic activity further than anyone had anticipated.

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Barriers to Change

Often the sources of poor performance in both private and public sectors reflect the ability of decision makers to overcome the barriers to change. Unfortunately, the ability of organizations to alter operating models is hampered by our cultural/social heritage as exemplified by the concept of path dependence. The degree to which our decision-making culture can change is not well understood. Too often change is superficially incorporated in business. For example, economic models are often adapted by changing a numerical entry on a spreadsheet. This change leads to a new solution without any change in the underlying equations and does not address any

relationship within that spread sheet. Such an approach may simplify learning, but it seriously misrepresents the process of decision making in the real world.

There are many sources of resistance to any of the choices we make in response to any change in the exogenous environment. The institutional structure, assumed or made explicit in our models, is inherited from the past and reflects a set of beliefs that may be significantly impervious to change—either because the proposed changes run counter to the belief system or because the proposed alteration in institutions threatens the leaders and entrepreneurs of existing organizations.

Change, especially if the implications of that change offer a different vision of the underlying socioeconomic structure, is very difficult to implement when trying to reach a solution within the current viable institutional arrangements that would support significant change. It seems that change is constant, but sometimes not implemented when met by entrenched interests. Enlightened management, for example, Grove at Intel, encourages open debate on the business model as standard operating procedure, much like the writers were encouraged to work on the TV program *Your Show of Shows*.[4]

Our inherited institutional structure reflects a set of beliefs about how the world works that is impervious to change because many in leadership roles have a vested interest in keeping the process working in a way they understand. When change runs counter to belief system or the alteration of the model threatens political/economic interests, decisions made in response to change may not reflect the economically optimal solution. Another complication to effective decisions that can occur in implementing a response to change is the recognition of interdependencies—change in just one area of business practice is incomplete and sometimes counterproductive if not complemented by changes elsewhere in the organization or the marketplace. An additional complication to responding to change is the time inconsistency among players. Not all parties have the same sense of urgency.

Moreover, two further complications make any change to the inherited structure uneven in its impact. First, altering the performance of an organization in response to an economic shock takes time—often longer than the time horizon of the business leader/political decision maker who must approve of these changes. The costs of economic adjustment often show up before the benefits; selling change therefore becomes a challenge to decision makers. The costs of adjustment to higher energy costs in the 1970s led to immediate problems for the automobile industry and electrical utilities, yet over time the energy efficiency improvements led to gains in auto quality, reliability, and a better environment. Second, consideration must also be given to people and businesses that are hurt by any change. For example,

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British Prime Minister Peel's attempt to repeal the Corn Laws would have meant a loss of trade protectionism for English landowners who benefitted from high agricultural profits, since the Corn Laws limited grain imports. When the Corn Laws were eventually repealed, the balance of economic power in England shifted permanently away from the landed gentry to the industrialists and trading economic interests. In the United States the deregulation of airlines in 1978 lowered prices for consumers and opened up more travel options to regional markets in selected areas. Yet, for airlines such as Eastern and Braniff, the drop in fares led to eventual bankruptcy, as neither firm could compete in a lower fare marketplace.[5]

Incentives provide a focal point for thinking through our decision-making approach. A poor performance institutional matrix does not provide incentives for productivity-improving activities. Some groups within organizations have a vested interest in existing structure, and so incentives (carrots and sticks) must be found to overcome entrenched interests. In organizations there are complex relationships between formal rules and informal constraints. Organizational decision-making structures are man-made, and to function properly they must be continually altered to reflect the continued evolution of human desires and ways of living. As the cultural/economic heritage of a society changes, so must the models we use to characterize that change. Over time, there is no set formula for economic development, so there is unlikely to be one framework that will provide a magic formula for all time. Model developers must understand the process of economic growth before a framework for analysis is created. Developers must then understand that changes in society will dictate changes in our model.

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Sources of Change: Economics

For public and private decision makers five economic factors—growth, inflation, interest rates, the dollar exchange rate, and profits—provide the context for success of any enterprise over time. The source of change in our models and our actions is often precipitated by the gap between what we expect and what we get for each of these five factors.

1. For **growth**, recessions are the surprises that throw us off but in 2008 to 2010, there was also the gap between how we modeled the world and what we thought was our future.
2. For **inflation**, the experience pre/post Paul Volcker's era at the Federal Reserve defines two very different models of the economy.
3. **Interest rates** take on a different character over the business cycle, along the yield curve and between instruments of different credit quality.

4. **Exchange rate** fluctuations have been the source of disaster for some financial institutions, including Barings and Franklin National, as well as the bane of countries over time.
5. Volatility in **corporate profits** influences the pace of investment in the economy and the wealth of investors.

DEVELOPING A DYNAMIC DECISION-MAKING PROCESS

Decision making is a dynamic process—not a solution—having two dimensions. First, decisions in the current period can be either our own as we anticipate change or as we respond to actual changes made elsewhere by others in the current economic environment. Second, this process is also dynamic because decisions made do not stand alone, but these decisions are part of a long sequence of decisions and responses. Once we make a decision, or face the challenge of decisions made by others, then we need to anticipate the implications of those decisions over time as well as how we respond to that change and subsequent changes down the road. In this sense decision making is like a perpetual chess match, in which moves and countermoves continue to offer short-term advantages, but never long-term dominance unless a company's winning position is guaranteed by a state or federal government. Moreover, each move is made after due consideration of the possible responses competitors may make to adapt to the initial move. Too often, decisions are portrayed in education or business literature as one-off responses to specific changes without the understanding that, like chess, we must anticipate and study not only our first move but the possible changes and responses in the environment in response to any decision we make.

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Creating a Framework

Any starting point for a picture of the economic framework facing any decision maker is by necessity very arbitrary and misrepresents the continuity of history. Long-term changes accompany any current snapshot, and yet we must start somewhere. In our initial framework we must start with some view of how our markets clear and the liquidity of the marketplace. In some cases, markets clear smoothly, as in the years 2003 to 2007 for housing and asset-backed securities, and yet, with the hindsight of history, liquidity and asset values were really not what they appeared to be.

When liquidity was not as expected, and actual did not equal anticipated, this information drove investors and households to react—sharply.

Financial disruption from mid-2007 to mid-2008 led to further market reactions and feedback that forced a new vision of the available financial opportunities for all. Choices were then made in the context of a new vision of the risks and opportunities. A new framework or model had to be patched together where continuous market clearing did not hold and the value of collateral and the creditworthiness of both borrower and lender were in question. Moreover, the speed of the correction to market models was swift—yet the adjustment over time to a new, stable, market is still going on. The market adjustments in the short run may not lead quickly to the ultimate long-run model, which may be a very different equilibrium over time. For example, the current low yields on Treasury bonds is unlikely to remain as the long-run yields, given the size of current and expected future deficits.

Our process recognizes the constant evolution of framework development, change, and the modification of the framework in response to the implications of change and the response to that change. Our first step is to define the framework, or economic context of our business model. Then we introduce a shock or change. For the decision maker, the next step is to estimate the impacts of the changes and then choose a response. Finally, we need to decide whether and how to alter our original model based on the change we have witnessed.

For the economic framework, we develop an understanding of the supply/demand fundamentals underlying our marketplace and how these fundamentals may be evolving over time. Our challenge here is twofold. We need to carefully balance our choices of fundamentals to capture the essence of the marketplace without overly detailing the model as to produce analysis/paralysis. We face a number of challenges in putting together a framework. First, there is a tendency to develop a framework around what we are familiar with, which means something current and often very comfortable. Hidden in this approach is the temptation to make implicit assumptions about how the world works when such assumptions may reflect the model/framework builder's prior bias, not the path in the future. We build around what is rather than what will be.[6]

Two sources of bias are particularly prevalent here that may distort the reliability of the framework. First, the structure and variables chosen for the model may reflect a confirmation bias. This bias reflects the tendency to gather information that confirms our prior beliefs about how the world works or our professional expertise. In the history of science we are familiar with the constant reworking of the Ptolemaic system so that new observations were fitted to an increasingly complex model of the universe. Another temptation for model building is framing where our assumptions in the model reflect the relative value we attach to risks/rewards for any given

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challenge. Often this framing will define why some leaders decide to pursue a certain course while others do not.

Introducing Change

Two distinct paths are available to decision makers—we can anticipate change or react to change imposed on us. In the optimum approach, we seek out our possible problems and then go about seeking a solution before there is big trouble. While that may be the best path, it is most often the path least followed.

Leaders, anticipating change, will first ask the right questions. Then these leaders design decision-making processes to engage everyone in seeking the right solutions. In this case, leaders recognize that the economic system is constantly evolving and what is expected is often what we don't get. Testing assumptions—and recognizing hidden assumptions—are the keys to success. Do home prices always go up? Are credit ratings really foolproof? Are these financial instruments really as liquid and marketable as we assume?

Change can sometimes appear invisible, like rot beneath a staircase, but breakdowns in the economic models of our institutions often evolve over time. Business standards are compromised. Guidelines are fudged. Sometimes our belief structure filters the information derived from experience and we see what we believe; we do not take a disinterested view of economic developments, but instead emphasize our past commitments and investments, thereby falling prey to the sunk costs bias of decision making.

Introducing change into our framework can be both enlightening and misleading. If the model framework is specified carefully and thoughtfully and change is properly introduced, the results can be enlightening. Stress testing a portfolio or business model can reveal the sensitive points in our framework. The essential element of successful building construction is proper testing. Expectations do not equal actual results and thereby we are moved to react. The sources of many shocks and surprises that we must deal with are often a surprise, since our expectations are priced into the actions we have taken in the past in either our professional or financial choices.

However, stress testing a model is often not carried out in order to reveal problems, but rather to reassure management that everything is all right. There are two aspects of ineffective change simulations. First, we change the impacts on the model by modest amounts or we only alter those factors that we feel comfortable that the model can handle. Unfortunately, once the model faces the real world such ineffective testing is quickly revealed—often with catastrophic results. While our knowledge about sources and the magnitude of change are always imperfect, we are wise not to compound our ignorance by using incomplete models of change.

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Second, within the real world experience, analysts often downplay information that contradicts or disproves their prior beliefs about the world, and there is therefore a recognition lag in many areas of human knowledge where change precedes the recognition of that change. From the view of cyclical change we have a history of changes in economic growth, inflation, and interest rates that alter course, sometimes rapidly, so that change leads to many business and political decision makers being behind the curve. With a longer view, there is a theme of creative destruction suggesting that over time, the common wisdom of our view of the world will be turned over by significant change.[7] Creative destruction represents a transformation that accompanies radical innovation. It is often driven by entrepreneurs, and effectively alters the path of economic growth as it destroys the value of established companies and laborers that enjoyed some degree of monopoly power derived from previous technological, organizational, regulatory, and economic paradigms.

Choice: Innovation or Staying with the Old Model

Since change is constant, then so are our choices. Continuous novel change requires constant innovation and therefore a revaluation of our framework. We upgrade our education, our standard practices, and our information-gathering networks. Once we introduce a shock or surprise into our framework, then we must recognize that any change, however dramatic or subtle, will be either an incentive that will reveal weaknesses in our existing framework—as was the lack of true liquidity in the subprime mortgage secondary market—or an incentive to move our economic activity in a certain direction—as was true of the rapid rise of both inflation and interest rates in the late 1970s.

Economic shocks on the supply side can come from many sources, such as drought or floods, changes in laws and property rights, and the emergence or collapse of an international commodity cartel. For decision makers the approach has to recognize that such economic shocks or changes mean that the economy will not return to the original equilibrium model or state of nature. To paraphrase Euripides, you can never step into the same river twice. Yet public policy sometimes attempts to go back into the old river. For example, in economics, the British government attempted to reestablish the Gold Standard after World War I with disastrous results.

Change, and its associated risk, is not symmetrical in its impact. For example, equal changes in opposite directions for growth and interest rates have significant different implications when faced by liquidity, budget, or financial constraints. Over the last five years the implications of a 10 percent

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appreciation in home prices is significantly different from a 10 percent depreciation of home prices that wipes out the borrower's home equity and therefore significantly alters the risk of default.

Finally, we recognize that changes can be easily simulated in a spreadsheet based on fixed mathematical relationships. Each change alters the model itself as actors in the economic world will react to change in defensive or innovative ways that cannot be captured or anticipated in a model based on fixed relationships. Moreover, relationships such as elasticity (a relationship based on percentage changes) along the supply and demand curves, change along the curve even if the absolute period to period changes are equal.

Feedback: What We Get Is Often What We Least Anticipate

What are the implications of a given change to the business directly and then, more interestingly, what are the possible implications for the framework itself? In most cases, we recognize that there is a range of possibilities for the implications of change and that this range of possible outcomes (and risks) depends on the time horizon of the decision makers.[8]

Moreover, even in a seemingly stable, short-run situation, there are undercurrents of dynamic change, such as demographics, that can be significantly impacted so that the future path of society/economy can be significantly different, depending not so much on the actual change, but rather on the state of the long-run changes in the economy. Tax policy, for example, has significantly different impacts between sectors of the economy. Demographics can be a harsh master with the evolution of Social Security and health care burdens over time.

From an opposite view, sometimes the same change implemented in an economy may have far more limited feedback given the cultural/historical context for the economy. For the analyst, estimating the feedback on the organization's prospects from any given change also faces, beyond the economic context, a number of decision-making impediments that will influence the path of any feedback response to change. Three bias factors are very common hindrances to getting the feedback estimate right: anchoring bias, recency bias, and illusory correlation. Anchoring bias allows an initial reference point to distort our expectations of the feedback. Organizations often start with the belief that the organization's basic model is correct and only small modifications are needed.[9] Anchoring bias is common in negotiating situations such as real estate and auto dealerships, where posted prices set a benchmark around which negotiations focus, even though in some

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cases the listed prices can be very far from market prices.[10] Meanwhile, the recency bias refers to the practice of referring to the last transaction or piece of information as the basis for the foundation point for future transactions.

Finally, there is the illusory correlation where two activities appear to move together, therefore creating an assumption of cause and effect. Unfortunately, the illusory correlation is too often the lazy path to analysis, resulting mainly in the creation of a significant number of sound bites.

The existence of the illusory correlation bias helps explain the tendency of many analysts to rely on truisms to characterize events rather than spending a bit more time thinking about the real underlying relationship.[11] In addition, there is also a tendency to pick the last straw on the camel's back to explain a collapse while ignoring the pile of prior straws. Unfortunately, the problem often is not the proximate cause of the collapse but the real problem was the weakened economic/financial state of the economy/company before the final straw.

In the history of economics we recognize one illusory correlation that was quite popular for a while: sunspot theory. While such a theory may have had some merit in an agrarian society, any correlation in the industrial age has certainly disappeared.

Today, the feedback effect on our model and any business framework has been altered by the emergence of globalization of markets for goods, capital, and, increasingly in recent years, labor markets. For many twenty-first century decision makers, the reality of an open, global economy is increasingly becoming part of the basic framework for the way forward.

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Choices: Taking Advantage of Change

Choices are part of the dynamic process of change and response—trial and error—that defines constant adjustment to an ever-changing economic landscape. Choices are constantly tweaked based on feedback we anticipate. That is, we choose a certain path anticipating what the market or our competition will do. We are familiar with this in such activities as chess or professional football. We also choose certain actions in anticipation of the news we will receive over time. Once again, we invest, for example, anticipating that the future earnings of a company will improve over time. Sometimes, the choices we make lead to dead ends or failure. But such mistakes also provide new information that can result in better solutions and, ultimately, success.

Often leaders see their decisions as confirming the continuation of the present framework. At other times decisions are made to be consistent with what leaders believe the new framework will be. There is a temptation to interpret history backward, that is, we interpret our historical experience in light of what we now know to be true so that we can say "everything

worked out in the end." Yet, in fact, we had very little clear vision of what was happening at the time. We also have a tendency to make history linear or cumulative; we connect all the dots we see as relevant to fitting our view of history. That is, we connect the dots we remember in our past whereas often history is random and many bits of our history are essential and others are purely accidental. Yet we tend to make the present situation appear to be the perfectly logical outcome from the past.

With every change in the the business environment, the opportunity arrives to build a better mousetrap. However, the other two legs of the tripod—economics and decision making—need to be considered. Leaders also need to recognize that economics is a science of choice, of tradeoffs, of risks. But biases in their decision making are prevalent. Whether leaders are conscious of it or not, choices are made from frameworks of their minds and these frameworks and their biases can mislead the best of policymakers.[12] In this section, the focus is on these tricks, what we call *biases*, and this focus is applied throughout the rest of the book.

Behind the range of choices open to decision makers is the concept of path dependence. This concept highlights how the set of decisions a person faces for any given circumstance is limited by the decisions that person has made in the past, even though past circumstances may no longer be relevant. Essentially, history matters but is not deterministic. Path dependence also recognizes the impact of a nation's or a company's culture when making decisions. Because of its experience after World War I, German culture is staunchly anti-inflation. Japan has a culture of caution and respect for personal relationships within business while companies in the United States have had a mixed culture toward workers and innovation.

Culture extends to the application of prospect theory when leaders make choices. Prospect theory suggests that the way we see the prospects of any choice—in favor of risk or leaning toward reward—will bias our decision one way or another. When we see an opportunity for reward we will interpret information in a way to bias our decision to seek the reward. Where we anticipate risk, we see the risks and avoid the activity. In addition, some people are risk-averse and others are risk takers. Therefore, decision makers and their organizations can look at the same problem and yet assess risk differently. For some investors a given price is an opportunity to buy or an opportunity to sell.

In addition, decision makers will make different risk/reward choices based on the size of the bets they make. This helps explain why lotteries still attract a lot of buyers even though the probability of winning is very low. The size of the potential gains or losses will influence the willingness to bet one way or another, even when the actual probabilities of winning or losing are the same. When the lottery value is very high, there is a tendency for

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some people to bet, while when the lottery value is much less they would not bet. The mental model that a decision maker and an organization have of risk and reward influences the choices they make in situations where there is risk. Despite these mental models, in reality, there are few choices that do not involve risk.

Framing, which simply means that someone frames a choice based on his or her view of the world, is another aspect of the choices that face decision makers. Commonly expressed, do you see the glass half-empty or half-full? In economics, we assume that all consumers make choices in the same way. In finance, we assume that all investors see risk/reward the same way. However, not all consumers or investors will make the same decision, even if the underlying circumstances are the same. Investors can view any change as either a threat or an opportunity. Often, leaders become rigid in their thinking when facing a threat—they hunker down, pull in their horns, and get defensive. In contrast, when they frame a challenge or threat as an opportunity, they become more flexible and adapt in ways that will enable them to succeed in that situation. They innovate. They make lemons out of lemonade. They focus on the gains and not on the losses.

Another reality of making choices is that any institution or rule adopted for a particular time, even if optimal then, may no longer be effective because the business environment has changed. How decision makers deal with new developments is a key to success. Rationing during wartime gives way after a war to open markets and often rapid inflation. How would a decision maker adjust to free markets, competition, and, in some cases, the loss of government subsidies? In recent years in America, airlines, trucking, and long-distance phone service were deregulated. Many firms adapted successfully. Many firms did not.

In some cases, systematic relationships—the relationships that are the core of the spreadsheets so many business decisions are based on—change over time in unpredictable ways and create fundamental uncertainties. During the 1970s, the rapid rise in inflation wrecked the long-held business model of savings and loans associations. The globalization of capital markets upset the links between the economy, interest rates, and the money supply, causing the Federal Reserve to drop the use of monetary targets. The emergence of Asian economic powers, first Japan and then China, has led American firms to question their competitiveness as well as how and where they do business.

The choices for action are frequently conditioned by leaders' personal experiences and, most importantly, their education. They apply what they have learned, and often they apply, metaphorically, a hammer to different situations even when they should be using a screwdriver. In this chapter,

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the focus is on three mental biases that shape the choices of leaders. In later chapters, other biases are discussed.

The first mental bias is that of sunk costs. These costs represent the time, effort, and financial investment a person has put into a project that cannot be recouped if he or she stops working today. People then have a tendency to escalate commitment to the same course of action while ignoring the marginal costs and benefits of a project. A person grits his teeth and commits to finishing a job no matter what. He reasons: Look at how much I've put into the project already. Good money is now thrown after bad. For example, investors double down on their bets, convinced that an investment they own, even if losing money, will turn around if only given enough time. The commitment by the French under Ferdinand De Lesseps, chief engineer, to build the Panama Canal failed. The French continued to pour money into the project far beyond the initial budget estimates while many workers died of malaria. The French never completed the project and the Panama Canal Company declared bankruptcy in 1888. The continued commitment to complete the Panama Canal, even after years of losses, represents sunk cost bias.

A second mental bias is the overconfidence bias, or hubris. This bias is particularly evident in successful entrepreneurs and can, in a favorable situation, lead to success and innovation, and yet can be associated with failure when the entrepreneur pushes her luck and attempts a project outside her capabilities or the project itself is just too big or difficult for the economic environment. Day traders, chefs as restaurant owners, and home builders are susceptible to this bias, which helps explain the high failure rates for these groups.

Overconfidence often comes to grief when entrepreneurs or organizations believe that their efforts can overcome the devastating winds of a recession or financial shock. Individuals vow to succeed but the history of railroads, commodity corners such as Jay Gould's attempt to corner the gold market shortly after the Civil War and the Hunt brothers' attempt to corner the silver market during 1978 and 1979, and interest rate volatility suggest otherwise. As the great economist John Maynard Keynes said, "The market can stay irrational longer than you can stay solvent."[13]

A third mental bias is that of anchoring. This bias occurs when a person allows an initial reference point to distort his estimates of the true value of a financial asset or good he wants to purchase. In recent years, this bias was seen in the real market price of many financial assets. For example, dot-com stocks were selling at prices far higher than the advertised prices of these assets at their initial public offering, and houses were listed at prices far above market value. This bias limits a person's choices because he

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negotiates from the position the seller would like to start from, not from a careful assessment of the true value of the asset.

In the early post–World War II period, policy makers feared the economy might fall into another Great Depression. In the early 1980s, policy makers feared the economy might again experience the rapid inflation of the previous decade. Overcoming these kinds of anchoring biases usually takes one of two paths:

1. Outside experts or a newcomer to a company often can evaluate the framework of an enterprise and the overall economy with a fresh eye to the opportunities and risks that are ahead.
2. An intellectual leader inside the company, such as Andy Grove at Intel or Steve Jobs at Apple, can cut through conventional business assumptions and identify the way forward. Many business leaders, central banks, presidents, and generals build their strategy and framework around "fighting the last war."

Beyond the biases, there are also three patterns of our decision making that can result in poor decisions. First, leaders may pursue a linear path to their goal and use familiar rules to recreate the future in line with the familiar past. For example, this is particularly true for investors who follow specific stock screening strategies so closely that many opportunities are passed over when the company does not fit criteria or rules. Many investors have little incentive to change the framework because it is mentally comfortable for them even though they recognize that they are missing some investment opportunities. In a way, this is an example of the bounded rationality we will discuss later. Sometimes decision makers know how the current decision-making system works, at least under the old rules, even if anomalies appear from time to time. For example, today we recognize that the model assumes that asset returns are normally distributed random variables and yet the investment returns in equity and other markets are not normally distributed. This is the fat tail problem where unusually large returns, positive or negative, appear more often than predicted in a normally distributed model.[14]

Second, decisions made by one firm often give rise to a response from competitors. The process of achieving the firm's goal proceeds more like a chess game than a preplanned, linear decision process where specific steps follow prior steps in lockstep.

Third, decision makers, particularly political leaders, may not consider the long-run implications of current decisions because their costs fall to a future generation. This is the time inconsistency problem that bedevils

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so many issues today, for example, entitlements (Social Security, federal and state pensions, and post-retirement health care) and the federal deficit. In each case, political officeholders make promises to current voters, but these promises will have to be paid for by future voters. Third, there is a distinction between risk and uncertainty that often becomes confused and leads to poor decisions—especially in finance.[15] Risk refers to the probability of different outcomes based on experience with similar outcomes in the past. Uncertainty is associated with the problem of not seeing this pattern in the past and having very little to go on to make a call on its probability. Lloyds of London, a British insurance market, is famous for betting on cases of uncertainty. Las Vegas sports betting reflects risk.

Decision Making as a Method of Making Choices

Economics is a discipline that focuses on choices. Choices never stop. Even when the environment appears quiet, inaction is also a choice. Challenges, shocks, and problems appear constantly, causing decision makers to reinvent the economy and their business models. Moreover, since the Enlightenment, when reason began to replace theology as a source of explanation and authority for science in the real world, each generation has pursued the study of its own unique problems and opportunities independent of ecclesiastical doctrines such as the writings of Descartes and Isaac Newton.[16] With the emphasis on science, the way forward led eventually to men landing on the moon.

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Moreover, the view here is not that just the problems have changed but the network of fact, theory, and the economic/business models has shifted. Leaders solve the problems of the old paradigm only to find that the paradigm has changed and, therefore, new, more complicated problems appear. In this sense, we never solve the problems of disease, poverty, or financial crisis simply because the model and the problems constantly evolve. Life spans get longer and the diseases of old age become a new source of research. People are richer today in modern industrial societies, yet the sources of poverty evolve. We are told that the latest financial regulatory reform will end financial crisis—yet history teaches us that financial crises are repeated, each with a slightly different set of causes and patterns.

In fact, it is the newness of the problems that make what economists do so exciting. They are not solving the same textbook problems over and over again. Instead they are stretching their model and themselves to examine a new model in new ways to achieve progress. Their choices also force them to reexamine first principles and stretch the boundaries of the old model, which is narrow and rigid and does not solve their problems. These choices extend

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their mental and emotional comfort zone and lead to a new paradigm, a new way of defining our world. This new framework can be labeled globalization.

Evolution of Our Frameworks

Globalization has meant that business decisions and processes that were successful in a closed economy are no longer effective in an open global economy. This can be seen in the auto and furniture industries in the United States where customer desires evolved faster than domestic producers could alter their production capabilities. In the field of international finance, the debt crisis in Greece in 2010 altered what was once thought to be a very stable euro framework.

To be truly successful, a new decision-making framework must explain and incorporate old behavior while designing a working model of how the world now functions. In reality, strategic decisions often evolve over time and proceed through an iterative process of choice, model building, and action. Each action is evaluated, the framework is tested, and then decisions are made on how to move forward. This is done with the expectation that the future differs from the past and that what was once successful in one area or time may not be successful in another area or time.

Three attributes of a new framework are important:

1. The framework must account for past mistakes and failures. If the same shocks and changes were to occur again, the new framework must be able to withstand the test.
2. The framework must allow decision makers to be flexible when responding to future shocks and changes.
3. The new framework must allow for the reality that it will change over time.

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Decision making is a continuous process. Economies evolve, competition responds, and so must decision making. Over the last 50 years, there have been significant changes and shocks in the five central economic drivers—growth, inflation, interest rates, exchange rates, profits, and our expectations of each in the past. Institutional frameworks that did not allow for rapid changes in growth (recession) failed, including those of retailers such as W.T. Grant and Circuit City. Other examples include the rapid rise in inflation during the 1970s, doomed wage-price controls, and the model of lending practiced by the traditional savings and loan associations. Interest volatility altered the basic framework of the bond investor and the long-term debt bond issuance. Exchange rate volatility destroyed institutions such as Franklin National and forced the European community to reduce

its exchange rate to one currency—a very innovative solution. Finally, profit volatility caused businesses to diversify, sign long-term supply contracts, and use hedging for critical supplies and output prices. Agricultural futures markets in Chicago began as an attempt not to speculate but as a way of hedging crop delivery prices so as to stabilize revenues in a volatile farming environment.

The reality is that the framework in the financial markets, as in all other markets, is constantly changing. Therefore, new rules and frameworks must be designed to deal with new problems that were unforeseen (unintended consequences in some cases) in the past.

Change is constant and needs to be accommodated in your thinking. At each step along the way, you need to be aware of decision-making biases that hinder your thinking and can lead to a suboptimal decision. Finally, five economic drivers are essential to all strategic business thinking. In fact, the biggest mistakes in most business decisions have little to do with the lessons learned in the traditional business curriculum. Instead, the greatest business failures revolve around not accounting for the unexpected movements of the five economic factors. This is covered in the next chapter.

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DISCUSSION QUESTIONS

1. In professional sports, opening day begins with all teams tied for first place, yet the history of league championships reveals that a select few franchises appear in the finals far more often than by chance.

   In examining this record of success (or in some cases you might want to identify why some franchises continue to fail), begin with your assessment of the correct process for winning in professional sports. What is your framework? When teams appear in championships across several decades (Yankees and Cardinals, Cowboys and Steelers, Celtics and Lakers, Canadiens and Redwings) what does that signify about their ability to react to change and develop a new framework for winning? Some franchises find a one-time solution, an outstanding player, such as Michael Jordan or Wayne Gretzky, but cannot sustain success after that player leaves. Why?
2. In business, Jim Collins, in his book, *Good to Great*, identifies companies that have sustained success over time despite the constant changes in the economic scene. For example, Collins examines the different approaches to labor and technology that Nucor and Bethlehem Steel adopted and the implications for each company over time.

   You have been recently appointed the CEO of a very large industrial equipment company that is not performing well.

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a. Define the economic framework for your company. One immediate challenge you have is that you are tempted to force the company's underperformance problems into conceptual boxes supplied by your post-secondary education.
b. How might your framework be influenced, and therefore how can you avoid, the recency and confirmation bias problems that might cause you to define your framework by the recent experience of the company?
c. Does your framework enlighten the perspective on the company or are you oversimplifying the company's framework?
d. How does your framework reflect the path dependence of prior CEO decisions? How did you get to where you are today, and does that limit your options for the future?
e. What are the entrenched institutional arrangements that you recognize in your framework? What are the vested interests of the current division leaders who directly report to you?

3. You have been appointed regional manager of a casual-dining restaurant chain in a moderate sized (1.5 million population) metropolitan area in the United States.
a. Explain the underlying economic structure of the demand and supply relationships for your business that define your economic framework.
b. What are the sunk costs associated with your current framework? Before you make a single decision, what types of anchoring bias should you be aware of going forward? How well do you know yourself as a risk taker or risk avoider, i.e., how would you see yourself in the spectrum of prospect theory?
c. Lehman Brothers has failed and the outlook for the economy has darkened quickly. What feedback does this change signal for your business? List three options for your action and suggest a choice for the business. What is your new framework for the business and how does that differ from the initial framework?
d. In an effort to make up for lost revenue, the county where your chain of five restaurants is located introduces a special tourism tax of 15 percent on all restaurant meals to pay for a new baseball stadium. Repeat the process of recognizing change, estimating feedback, making choices, and developing a new framework, and discuss how the influence of an anchoring bias impacts your judgment of closing one restaurant and moving to a new county.

Explain your expected feedback from such a change and then your choices to deal with this change.

4. Leadership sometimes has its own interests at heart, with often tragic consequences. Consider the following circumstances and offer your

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assessment on the impact of leadership, or lack thereof, in the following actions. Consider for a moment, too, what framework the leader had adopted and how that might be different from what others had expected.

a. General McClellan's preference for parading troops rather than fighting and Lincoln's response.
b. The Central Intelligence Agency's view of the Bay of Pigs operation and President Kennedy's assumption about their input to his decision making.
c. Polaroid's failure to pursue digital photography and their shareholder expectations.
d. The role of some of Enron's senior management and the expectations of the workers and shareholders.
e. Trade protectionism and earmarks within the framework of a congressman doing the best for his constituents or for the general welfare.

These are not easy problems and often represent a conflict of the framework or vision and that conflict is part of real world decision making, not the product of a textbook exercise with a neat, precise solution.

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NOTES

1. For baseball, Michael Lewis's book, *Moneyball* (New York: W.W. Norton, 2003) represents a shift in the model of how baseball championships are won.
2. Richard E. Neustadt and Ernest R. May, *Thinking in Time: The Uses of History for Decision-Makers* (New York: The Free Press, 1986).
3. James O'Toole, *Leading Change* (San Francisco: Jossey-Bass, 1995).
4. Richard Tedlow, *Andy Grove: The Life and Times of an American* (New York: Penguin Publishers, 2006). *Your Show of Shows* appeared from 1950 to 1954 on NBC and featured a team of famous writers who spent considerable time debating every show.
5. See A. E. Kahn, "Surprises of Airline Deregulation," *American Economic Review*, Papers and Proceedings 78, no. 2 (May 1988): 316–322.
6. See Jim Collins's discussion of Kroger and A&P in *Good to Great* (New York: HarperCollins, 2001).
7. Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (New York: Harper & Brothers, 1942).
8. Hugh Courtney, Jane Kirkland, and Patrick Viguerie, "Strategy Under Uncertainty," *Harvard Business Review* (November–December, 1997).
9. This reluctance to alter a winning formula was characteristic of Montgomery Ward and Ford Motor as written up in John Steele Gordon's essay on "The

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Perils of Success" in his book *The Business of America* (New York: Walker & Co., 2001).

10. Price and wage expectations can be slow to adjust to the realities of the marketplace as we have seen in both housing and labor markets over the period 2007 to 2010.
11. For a good example in the historical context, see Neustadt and May, *Thinking in Time*.
12. Douglas North, *Structure and Change in Economic History* (New York: W.W. Norton, 1981), 11.
13. John Maynard Keynes, *Essays in Persuasion* (New York: Harcourt, Brace & Co., 1931).
14. Popularization of this concept appears in Nassim Taleb, *The Black Swan* (New York: Penguin, 2007). The original insights come from Benoit Mandelbrot, a French-American mathematician who observed that financial prices, as well as cotton prices, did not follow the expected normal distribution. Thus fat tails in the distribution were very common in many statistical and economic series and hence outliers, termed *black swans*, were much more common than previously expected.
15. Frank Knight, *Risk, Uncertainty, and Profit* (Boston: Houghton Mifflin, 1921).
16. Descartes' *Discourse on the Method* and Newton's *Principia Mathematica* are considered founding tracts for the Enlightenment.

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