

Difficult decisions for an uncertain world  
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At first glance, the phrase “mastering uncertainty” appears to be something of an oxymoron. One can master a horse, or master a foreign language, but uncertainty? We definitely cannot master uncertainty in the sense that a trainer masters a horse by bending the beast to his will. Uncertainty arises out of the kaleidoscopic shifting of numerous volatile variables, such as regulation, technology, competition, macroeconomics and consumer preferences. Complex interactions among these factors generate fleeting opportunities and threats, but we can neither predict nor dictate their precise form, magnitude or timing. Long-term prediction, let alone control, is out of the question.

We can, however, aspire to master uncertainty in the way a seasoned sailor masters the sea. Not even the best captain can predict the elements with accuracy, let alone command the wind to blow or the waves to calm. With insight and experience, however, a captain can harness the wind and ride out the storm. Mastery, in this sense, resembles improvisational skill rather than control. This begins with an understanding of uncertainty, how it differs from risk, and general approaches to dealing with an uncertain world.

#### *Risk, uncertainty and profit*

Discussions of uncertainty and risk tend to draw even the most hard-nosed thinkers into a haze of metaphysical rumination – recall Donald Rumsfeld’s speculations on unknown unknowns, for example. But clarity is possible. The economist Frank Knight made significant headway in his influential 1921 treatise *Risk, Uncertainty and Profit*, in which he made the distinction between risk as randomness with knowable probabilities – think the roll of a dice – and uncertainty as randomness where we cannot know the probabilities.

Critics have dismissed Knight’s distinction as trivial. According to this critique, decision-makers who do not know the objective probabilities simply assign subjective probabilities to various outcomes and get on with it. But this criticism attacks a caricature. A careful reading reveals a more nuanced distinction between risk and uncertainty.

People encounter risk when they face a simple choice. Examples include a punter deciding to place a bet, a fund manager considering an investment or a homeowner evaluating hurricane insurance. The decision-maker can clearly identify the possible states of nature relevant to the choice they face. The gambler, for instance, knows that there are precisely 38 possible pockets where the roulette ball could land.

In many simple choices, the possible states of nature are bimodal – the team will beat the spread or not, a hurricane will damage a house or not. At other times, they extend along a single dimension, such as the range of possible returns to an investment.

The challenge in simple choices lies not in specifying outcomes, which is relatively straightforward, but in assigning ex ante probabilities to their occurrence. Often, simple choices are similar enough that they can be treated as comparable

observations, aggregated and analysed statistically. Investors can, for example, collect and crunch data on historical stock performance across many companies, industries and time periods, and use their analyses to estimate a probability distribution for the investment under consideration.

Risk resides in simple choices, but uncertainty arises in messy situations, where the variety of possible actions is nearly infinite. Senior executives at BT, to give a concrete example, face a daunting number of levers they could pull to improve performance, including the use of outsourcing, acquisitions, lobbying and cost-cutting initiatives, to name just a few. When people face a range of possible actions – versus a simple yes/no decision – the information relevant to guide their actions grows more complex. They must decide which levers to pull when, how hard, and in which combination and sequence.

In messy situations, managers cannot specify *ex ante* all the possible states of nature that might influence their action. The optimal combination, sequence and timing of future actions will depend critically on the interaction of many external variables, including shifting regulations, unstable commodity prices, the entry of new rivals, changing consumer preferences, volatile exchange and interest rates, fickle capital markets, geo-political events, natural disasters and continuous technological change – not to mention the responses of competitors who will do their best to thwart managers' best-laid plans.

Managers face uncertainty and investors face risk, although the world is equally volatile for both. The distinction hinges on the range of possible actions they can employ to achieve a desired outcome, which is complex for executives and simple for investors. Or to take a sports analogy, the punter chooses whether to bet or not, but the coach must juggle myriad interactions of trades, training, strategy and tactics to win.

Consider the following thought exercise to clarify the distinction between risk and uncertainty. Imagine Warren Buffett goes to the mountain and God hands him a tablet with the correct probability distribution of possible market capitalisations for a company a decade hence.

Assuming Mr Buffett's investment horizon is ten years, this information is most useful in deciding whether or not to invest. For the company's CEO, this information is practically useless. He would need much more granular information about how competition, technology, regulation, macroeconomics and other factors might interact to create specific opportunities or threats. Only this more detailed information would allow him to take precisely the right actions in the right combination at the right time.

People sometimes attempt to collapse complex uncertainty into simple risk, by framing a messy situation as a big bet. Recall European telecommunication service providers' €100bn outlay for third-generation mobile technology licences. Many saw this as a risky bet that would either pay off or not.

But returns to the 3G investment depended critically on interactions with other factors, including regulatory policy influencing returns on capital and competitive intensity, the progress of potential substitute technologies, capital markets' willingness to support subsequent investments, and competitive thrust and parry among others. The telcos faced uncertainty, not risk. Managers should, of course, hive off and manage pockets of risk when possible – buying insurance for likely

contingencies, for example, or hedging exchange rate exposure. They should not fool themselves, however, into believing they can reduce all uncertainty to risk.

*Strategic anticipation, organisational agility and uncertainty absorption*

Business, to paraphrase the Danish philosopher Søren Kierkegaard, can only be understood backward, but it must be managed forward. So, how can executives survive and thrive in an uncertain world? Adapt or die, is the short answer. Uncertain markets exert an unforgiving selection pressure on companies by churning out an unrelenting series of opportunities and threats. New companies emerge to pursue novel opportunities, while established companies that cannot adapt fail. The only way to avoid this harsh Darwinian pressure is to adapt to changing circumstances before market pressures select against your company.

This is an easy concept to understand, but it is hard to translate into practice. Adaptation can be broken down into two components – strategic anticipation and organisational agility. Taken together, these two ideas provide a potent one-two combination. A boxer can anticipate what an opponent might do by studying tapes of his opponent's previous fights. This preparation is useful even if the precise blow-by-blow chronology cannot be known in advance. By improving hand speed and footwork, a pugilist can improve his ability to roll with the punches and adapt to whatever opportunities and threats emerge in a bout.

Anticipation and agility make for good viewing – recall Muhammad Ali floating like a butterfly and stinging like a bee. But they are not the only way to win a fight. Boxers like George Foreman or Rocky Marciano lacked the bob and weave of their more agile opponents, but they could absorb great punishment, outlast opponents and stay in the fight long enough to deliver a decisive blow.

Uncertainty absorption represents another distinct approach to dealing with the unknown. In business terms, this refers to general-purpose actions that help the company absorb unexpected contingencies, such as lowering fixed costs or strengthening the balance sheet. Uncertainty absorption techniques lack the bob and weave showmanship of adaptation but often prevail.

*Strategic anticipation* In uncertain markets, managers cannot peer deep into the future to make accurate long-term predictions. They can, however, gather real-time data from multiple sources, look for patterns from the present and past, and select mental models to represent the situation. They then use the selected model to anticipate how circumstances might unfold.

Effective strategic anticipation hinges on pattern recognition, a daunting task in uncertain markets. Managers must identify early warning signals from the welter of data, see fresh connections among apparently unrelated events and find the needles of decisive variables among the haystacks of insignificant ones. They must do this in real time based on data that are incomplete, ambiguous and often conflicting.

Pattern recognition depends on sensing a situation in all its complexity. It requires managers to scan their environment by gathering data from multiple sources and to make sense of the information through informal discussions and formal scenario planning. While methodical data collection and analysis play a role, countless other less formal sources of data – both planned and accidental – may provide the critical piece of the puzzle that triggers pattern recognition.

Managers who sense their environment and select an appropriate mental model still run a great risk. Even the best model can outlive its utility as circumstances change. Executives must keep their mental model fluid and modify it as the situation evolves. Indeed, they must be open to the possibility of abandoning their model altogether and replacing it with a new one if required.

But how can executives recognise when their mental model has passed its sell-by date? The tendency to fixate on data that confirm expectations and ignore non-confirming information leads many executives to hold on to their mental model for too long. Part of effective sensing is remaining open to surprises, anomalies and unexpected findings.

In an uncertain world, managers must recognise that their mental models are provisional – useful for now but subject to revision as circumstances change. They must be open to incongruities that signal a gap between their stable mental model and a fluid situation. When managers observe an anomaly, they should investigate it by gathering firsthand data and digging deeper into the source of the discrepancy.

*Organisational agility* Anticipation is primarily a cognitive process of selecting the appropriate mental model for a situation and revising it when necessary. Agility, by contrast, refers to an organisation's flexibility in undertaking new activities or abandoning old ones in the light of changed circumstances. To succeed consistently with unexpected contingencies, companies need the organisational agility to execute quickly and effectively against novel priorities, rather than doing the same thing over and over again.

Adaptation poses several specific challenges. Companies must, for example, balance defence and offence. Despite all the frothy rhetoric about the need to innovate or die, defending the core business remains critical. A solid core allows companies to stay in the game long enough to seize golden opportunities when they arise and also provides the wherewithal that enables them to invest in new opportunities. Despite many slip-ups, Apple Computer survived long enough to be in the game when the golden opportunity of online music arose.

At the other extreme, an exclusive reliance on the core leaves companies susceptible to long-term decline. Defence can keep you in the game, but it cannot win it for you. Had Apple's management team stayed in a defensive crouch protecting its declining core, it would have failed to regain the initiative with the iMac.

Adaptation also requires executives actively to manage a portfolio of internal initiatives to prepare their company for opportunities or threats that might arise in the future. Small-scale experiments in new products, services or processes, for example, allow companies to probe how the future might unfold. They also provide the foundation for rapidly scaling a business if circumstances warrant.

*Uncertainty absorption* Tactics to absorb uncertainty build resilience against good and bad shocks without trying to anticipate their specific form, magnitude or timing. These include blocking and tackling steps, such as lowering fixed costs or increasing operating efficiency that allow companies to weather unforeseen threats. Although not sexy, such tactics allow companies to outlast less efficient rivals and stay in the game to seize golden opportunities as they arise.

Although it is currently out of fashion with many investors and academics, diversification within an organisation protects companies against unforeseen threats to core businesses and positions them to seize unanticipated growth outside the core. But diversification comes at a cost. By increasing organisational complexity and diffusing resources, it can leave a company vulnerable to more focused rivals. In addition, many investors prefer executives to leave the diversification to them.

Despite this, managers can win some of diversification's rewards without paying the full cost. They can follow the "rule of two" by limiting diversification to two markets. Like the human body's doubling up on lungs or kidneys, this provides some diversification against unforeseen loss while keeping the costs of complexity to a minimum.

Managers can also diversify geographically while retaining a tight industry focus, as Mittal Steel has done, or diversify around a set of resources or competencies, as the Royal Bank of Scotland has done by experimenting with multiple channels and brands based on a core operations backbone. In these cases, companies can reap the benefits of diversification while minimising the costs of complexity and diffusion.

In contrast to specialised resources – such as dedicated manufacturing capacity or real estate – a war chest of cash or low leverage also allows a company to survive threats and seize opportunities that executives did not anticipate. Cash and borrowing capacity resemble the troops a general holds in reserve waiting to commit to a decisive battle.

As the airline industry illustrates, a healthy balance sheet applies equally to downside and upside. With one of the strongest balance sheets in the industry, aircraft manufacturer Embraer survived a sharp fall-off in orders from airlines after the September 11 terrorist attacks, while its highly leveraged competitor Fairchild Dornier went bankrupt. Emirates relied on its healthy balance sheet to order 45 of the double-decker Airbus 380 aircraft on very favourable terms because most of its rivals lacked the wherewithal to acquire the new jets.

Whether we like it or not, uncertainty is an unavoidable fact of life. Strategic anticipation, organisational agility and uncertainty absorption offer the promise of helping to seize opportunities and weather threats that we can neither predict nor control.