Risk and Uncertainty in International Business

Steven Globerman

Lecture Notes for MBA 515 (Winter 2012)

INTRODUCTION

In last quarter’s discussion of international business strategy, no explicit attention was paid to a fundamental feature of the international business environment. Namely, that environment is highly uncertain. Put differently, managers may feel they have a substantial amount of information about market conditions, political conditions and so forth in different countries and regions, but forecasts about changes in those conditions are likely to be inaccurate. Significant and unforeseen alterations in the business environment can be sources of positive or negative changes in a company’s profitability. In all cases, variation in profitability constitutes a source of risk for stakeholders in a company—including shareholders. All other things the same, stakeholders prefer stability in an organization’s performance. Hence, an important component of strategy involves managing uncertainty.

To be sure, even purely domestic firms face an uncertain environment; however, the general consensus is that the scope and intensity of uncertainty increases as an organization does business in a larger number of countries and regions. There are several reasons for this. First, important differences across countries in the broad business environment make it difficult to utilize the experience of doing business in one location to improve management’s understanding of how to carry out business activities profitably in other locations. Put differently, one is more likely to be “surprised” by events when one has limited information or insights into the precursors of those events.

An illustrative example of this phenomenon is Nomura Holdings, Inc., a large Japanese investment banking company. Nomura acquired Lehman’s international operations in September 2008 when Lehman was in a financial crisis that ultimately resulted in its bankruptcy. Nomura had some limited
previous business experience in the U.S., but its acquisition of Lehman substantially increased the size of its labor force in the U.S. and Europe. Nomura encountered substantial problems integrating Lehman’s investment bankers with its existing employees. In particular, female investment bankers originally hired by Lehman complained about Nomura’s human resource practices including the imposition of strict dress codes. They also complained about Nomura’s human-resources department changing some women’s email addresses to their married names from their maiden names without asking which names they used professionally. Cultural differences also impacted male Lehman employees. For example, bankers from the Lehman side said that they found the process of getting approval for deals in which Nomura put its capital at risk to service clients was slower and more difficult than it was at Lehman.

The problems Nomura faced in trying to integrate its U.S. investment bankers into its global workforce resulted in departures of key employees and a disappointing financial performance of its Lehman acquisition.¹ While it is easy to criticize Nomura’s management for its seeming failure to “understand” relevant cultural differences, many such differences are obvious only with the hindsight of actual experience.

Another reason that international managers typically face more uncertain environments than purely domestic managers is that environmental conditions often change more discretely and dramatically abroad than in the home country. This is particularly true for companies headquartered in wealthy developed economies that diversify into emerging markets. Political institutions in emerging markets are often poorly governed with inconsistent outcomes, while government laws and regulations frequently reflect the influence of powerful politicians and civil servants rather than the rule of law protected by an independent judiciary. Changes in the identities of those in power can therefore dramatically influence legal, regulatory and related business conditions in many countries.

The use of different currencies across countries and regions also contributes to increased uncertainty for international managers. Unanticipated changes in exchange rates can dramatically alter the economic advantages of carrying out specific value chain activities in one or another location, particularly when the organization’s cash flows, assets and liabilities are denominated in currencies other than its focal currency.²

---

² The focal currency for an organization is ordinarily the organization’s home country currency.
In summary, underlying differences across countries in formal and informal institutions, particularly those related to culture, contribute to international managers facing greater strategic uncertainty than their domestic counterparts. In addition, economic and political conditions often change more discretely and dramatically in foreign countries, particularly for managers of companies headquartered in developed market economies.

RISK VS. UNCERTAINTY

One frequently reads or hears about the risks or uncertainties surrounding the global economy. Notable in the present context is the ongoing sovereign debt crisis in Europe with the attendant threat of the breakup of the Eurozone.

While the terms “risk” and “uncertainty” are often treated as synonyms by business journalists, they are technically distinct. Furthermore, the technical distinction has important strategic implications for managers, although, in practice, most situations are more accurately characterized as being uncertain, rather than being risky. The essential difference between risk and uncertainty relates to whether alternative potential “states of nature” can be assigned objective and fairly reliable probabilities. For instance, the continued existence of the Eurozone can be considered a state of nature. If one could assign with reasonable confidence a probability to the continuation of the Eurozone’s current membership, one would characterize that state of nature as being one of risk. In fact, it is more realistic to characterize it as uncertain.

Objective probabilities are derived from historical experience. For example, insurance companies can estimate fairly accurately the probability of auto accidents in specific locations based on accident histories in those locations. On the other hand, a common currency zone encompassing different nations is a relatively rare historical event. Indeed, the Eurozone is a unique development, and there is little one can draw upon from historical experience to develop objective probabilities of the Eurozone surviving (or not surviving) the current turmoil surrounding it. As such, it is more accurate to characterize the relevant state of nature, i.e. survival of the Eurozone, as being uncertain rather than risky.

While it might seem to be a matter of indifference as to whether a given state of nature is characterized as risky as opposed to uncertain, the economic implications of taking specific actions can

---

3 More generally, a state of nature can be thought of as a particular economic, political or social condition that influences in a significant way the outcome of any strategic management decision.
vary depending upon whether relatively reliable objective probabilities can be assigned to specific states of nature. In particular, when the probability of a specific state of nature can be accurately estimated, it is usually possible to insure against an adverse outcome associated with that state of nature. For example, one can buy fire insurance for a business establishment from a host of different insurance companies and at very competitive prices. Hence, “straightforward” types of business risk can be managed relatively easily. On the other hand, uncertainty is more difficult to manage, since competitively priced insurance policies issued by third parties are usually unavailable.

ILLUSTRATING THE CONCEPTS

It is helpful to discuss the strategic implications of risk and uncertainty by first setting out some algebraic notation. In the simple 2x2 matrix in Figure One, two states of nature are identified. $S_1$ references the condition that the rate of exchange of the Euro relative to the dollar will average less than $1.30$ U.S./Euro over the next five years. $S_2$ references the condition that the rate of exchange will average more than $1.30$ U.S./Euro. Two specific actions (or strategic initiatives) are also identified: $A_1$ references a strategy to construct and operate a factory in Italy to manufacture a specific product to be sold in the United States. $A_2$ references a strategy to construct and operate a factory in the U.S. to manufacture and sell that same product in the U.S.

The numbers in the cells represent the expected net profitability after capital costs of each of the two actions under the two states of nature. Hence, $P_{11}$ represents the expected net profitability of building the factory in Italy given that the exchange rate averages less than $1.30$ U.S./Euro. $P_{12}$ represents the expected net profitability of building the factory in Italy given that the Euro averages more than $1.30$ U.S. $P_{21}$ represents the expected profitability of building the factory in the U.S. given that the Euro is worth less than $1.30$ U.S., on average, over the next five years. $P_{22}$ is the expected profitability of the U.S. factory given a higher valued Euro.

![Figure 1](image_url)
Now imagine that the company in question has a forecasting model that has had substantial historical success in forecasting the U.S. $/Euro exchange rate. The model strongly predicts that the Euro will average below $1.30 U.S. over the next five years. In fact, it makes the forecast with 95% confidence. If one uses that forecast as the basis for making a decision, management can develop expected value estimates for each action. Specifically,

1. $EV(A_1) = .95(P_{11}) + .05(P_{12})$
2. $EV(A_2) = .95(P_{21}) + .05(P_{22})$

If there are only two possible decisions (invest in Italy or invest in the U.S.), the decision rule is straightforward: invest in Italy, if $EV(A_1) > EV(A_2) > 0$. Invest in the U.S. if $EV(A_2) > EV(A_1) > 0$.

In fact, the decision maker in question will ordinarily have at least one other option. Namely, he or she can delay making the investment decision. This option might be preferable under a given set of circumstances discussed below. What we consider now is the decision-making context if the company has no reliable way to forecast exchange rates, so that objective probabilities cannot be assigned to $S_1$ and $S_2$. In this latter case, we are concerned with decision-making under uncertainty.

There are various possible decision-making rules that might be considered when making decisions in the context of uncertainty. For example, there is the “maximin” decision rule which calls for the decision-maker to choose the action which promises to maximize the minimum possible estimated gain under either action $A_1$ or $A_2$. To illustrate this rule, we assign arbitrary numbers to $S_{11}$, $S_{12}$, $S_{21}$, and $S_{22}$ as follows:

$S_{11} = 20, S_{12} = 5$
$S_{21} = 6, S_{22} = 22$

The maximin strategy would therefore lead to the choice of building the factory in the U.S., since that strategy results in a minimum expected gain of 6 which is higher than the minimum expected gain of 5 that would result from building the factory in Italy.

Other possible decision rules include “minimax” and “minimax regret.” The first focuses on minimizing the maximum possible loss associated with either strategy. Since there is no possible loss associated with either $A_1$ or $A_2$, the minimax strategy would probably not be relevant in this case. Minimax regret is a decision-making rule designed to minimize the maximum “opportunity loss” that might be realized under either action. For example, if the manager chose to build the factory in Italy, he
or she would “regret” doing so if the $S_2$ state of the world emerged. This is because the organization would earn 5 by building in Italy but would have earned 22 by building in the U.S., so there would be a foregone gain of 17 which can be considered an ex post opportunity cost of building the factory in Italy. Conversely, building a factory in the U.S. would result in regret if $S_1$ materialized, since the foregone gain would be 14 under this scenario. Minimizing regret would therefore dictate building the factory in Italy.

The choice of any particular decision-making rule will depend upon factors specific to the decision-maker, such as the latter’s attitude towards risk. At this point, we are less concerned with the precise decision rule chosen as we are with strategic initiatives that create a more “favorable” decision-making context. For example, more information generally results in better decisions, because (among other things) the various potential payoffs will be more clearly defined. Hence, an aspect of making strategy under uncertainty is to identify and implement initiatives that contribute to more informed decision-making. As well, it might be possible through strategic initiatives to contribute to and expand the set of possible outcomes. Continuing our example, it might be possible to subcontract output production from an existing and under-utilized plant in either Italy or the U.S. This strategy would create additional potential payoffs under the two states of nature, and the new potential payoffs might be superior to those associated with owning the factory.

In the next section of this paper, we discuss some strategic initiatives to manage risk and uncertainty.

INITIATIVES TO MANAGE RISK AND UNCERTAINTY

In most discussions of decision-making under uncertainty, it is typically assumed that the manager accepts the existing “payoff matrix” and chooses a decision-rule that identifies the preferred action to take. However, a more realistic strategic focus would acknowledge that managers can frequently modify the payoff matrix to create additional (and possibly more favorable) potential outcomes.

Creating Flexibility

One prominent strategy to deal with uncertainty is to create flexibility so that the organization can delay or alter its decisions at relatively low cost if an unfavorable state of nature materializes. For example, imagine that by delaying its factory investment decision for a year or so, the organization discussed earlier would have a more reliable forecast of the U.S. dollar/Euro exchange rate, perhaps because the Eurozone countries will have agreed to a plan to resolve the sovereign debt crisis. In the
limit, for example, the organization might come to believe that the Euro’s future value will certainly exceed U.S. $1.30 over the balance of the planning horizon. As a consequence, building a plant in the U.S. would clearly emerge as the more profitable action. The implication is that delaying the investment decision might be the most beneficial action to take in the short-term, since it could help avoid building the factory in an undesirable location.

Some strategies to gain flexibility may be better than others. For example, rather than simply waiting a year or two to build a factory in either Italy or the U.S., the organization in question might put itself in position to act quickly once it did decide whether and where to build the factory. For example, it might be possible to acquire options on prospective sites for a factory in each country. The options would give the organization (for a price) the right to acquire full ownership of the land at some future date. By acquiring options on prospective factory sites, the company would put itself in a position to begin construction quickly in one or the other country once uncertainty about the exchange rate was reduced. It would also avoid having to make large sunk costs associated with actually building a factory in one or another country and then finding that the future exchange rate made the original location choice an unprofitable one. How much the organization should be willing to pay for the land option (or other real options) will be discussed in a later lecture.

An option on a land site represents what might be called a real option to expand. It might also be possible to create options to abandon an activity. For example, it might be possible to take in some local equity partners to share the costs of constructing and operating the factory (in either Italy or the U.S.) with a side agreement that the company can (at some point in the future) sell its share of the factory to one or more of the partners at some pre-agreed price or some pre-agreed process for determining a “fair market” price. An agreement allowing the company to sell its ownership share to local partners can be seen as an option to abandon the investment in the event that forthcoming information points to the investment as being unprofitable. There will ordinarily be a cost to acquire an “options to abandon.” Among other things, the organization’s reduced ownership share from taking in equity partners means that it will enjoy lower profits in the event that the factory turns out to be a successful investment.

To continue this discussion of creating flexibility in the face of uncertainty, yet another strategy might be considered by the organization in question. Specifically, it might consider establishing factories in both Italy and the United States with the expectation that it will abandon or sell one of the plants, while expanding the other plant, depending upon revised expectations about the future U.S. dollar/Euro exchange rate. Hence, it would build two relatively small factories initially, one in each country, and then
expand the “favored” factory to a minimum efficient size while abandoning or selling the other, once management had more confidence in its exchange rate forecast.

Third-Party Insurance and Self-Insurance

A major challenge to management when making decisions under significant uncertainty is to minimize sunk cost losses associated with making the “wrong” decision, ex post, while putting its organization in a position to take full advantage of profitable opportunities that emerge over time. Creating alternatives, or real options, is one broad strategic approach to addressing this challenge.

It might again be emphasized that many, if not most, important managerial decisions are surrounded by uncertainty about relevant states of nature. Specifically, reliable objective probabilities are difficult to assign to the states of nature. Nevertheless, in some cases it is still possible to buy insurance from third parties to prevent or reduce losses associated with a specific state of nature materializing.

As an example, it is ordinarily very difficult to predict political events such as foreign government expropriation of private investments; however, the U.S. and other national government agencies sell insurance policies that cover expropriation actions by foreign governments, as well as other political risks. Private and public insurance is also often available for natural disasters that can cause serious disruption to an organization’s global supply chain. Insurance can also be purchased for other supply chain contingencies such as acts of piracy or terrorism. Private insurance policies will reflect the uncertainty surrounding the insured state of nature, as well as the value of the assets being insured. In particular, when it is difficult for private insurers to assign reliable probabilities to specific contingencies such as acts of piracy, perhaps because such events are irregular and idiosyncratic, insurers will build relatively large margins into the premia they charge their customers.

Financial instruments can also serve as indirect insurance when they are available as instruments for hedging against specific states of nature. For example, adverse changes in the home currency-values of cash flows denominated in foreign currencies can be hedged by selling (or buying) forward anticipated foreign currency cash flows using forward or futures contracts. Buying or selling forward anticipated foreign currency-denominated cash flows is equivalent to purchasing an insurance contract guaranteeing a specific home currency value for the anticipated foreign currency-denominated cash flow that is either sold or bought forward.
In cases where third party insurance is either unavailable or prohibitively expensive, companies may choose to “self-insure.” This is most typically done by setting aside a certain portion of a firm’s financial capital to cover adverse outcomes associated with specific states of nature. For example, an oil company operating drilling rigs in Nigeria might decide that it is too expensive to buy insurance against its employees being kidnapped by rebels and choose, instead, to invest a portion of its oil revenues in financial assets that would be sold to pay compensation to the families of kidnapped employees, as well as to pay for damage to oil rigs and other property. Alternatively, oil companies might choose to “self-insure” by hiring private security guards to protect its property and employees.

SYNTHESIS AND CONCLUSIONS

The main points of this essay can be summarized as follows:

1. International business managers operate in a more uncertain decision-making environment than do managers of purely domestic businesses.

2. Uncertainty exists when it is difficult to assign reliable probabilities to states of nature that influence the outcome of specific strategies. Conversely, if probabilities can be confidently assigned, managers are dealing with predictable risk.

3. It is easier to manage risk than it is to manage uncertainty. In particular, it is easier to estimate the expected values of alternative strategies. It is also easier to purchase relatively low cost insurance against undesirable outcomes.

4. Uncertainty is a relative concept. That is, there is no “bright line” separating situations of uncertainty from situations of risk. Nevertheless, it seems fair to say that, more often than not, international managers cannot reliably assign probabilities to specific states of nature by drawing upon large samples of data from historical experience.

5. To be sure, it is better to know more about the likelihood of relevant states of nature than less. Hence, acquiring and utilizing information that reduces, if not eliminates, uncertainty can be a valuable initiative to manage uncertainty. Put differently, profitable strategies are more likely to be identified when managers know more about:
   a) The states of nature that are particularly important to the financial outcomes of specific strategies;
   b) The likelihood of each state of nature;

---

4 For example, one is presumably better off if one can be confident that the probability of an event transpiring is between 20% and 70% than if one had no idea at all of the relevant probability.
c) The financial outcome associated with each states of nature.

6. International business scholars distinguish between exogenous and endogenous information. The former is information that becomes available without the organization in question needing to take any specific action. Often, exogenous information emerges as a function of the passage of time, e.g. will China’s economic growth rate slow down substantially? The production of endogenous information requires an organization to do “something.” For example, an organization might remain highly uncertain about whether it understands the preferences and behavior of Chinese consumers until it tries to market a product to those consumers.

7. The fact that valuable information about important states of nature is often revealed through the passage of time means that waiting to implement a specific strategy can have a relatively high financial rate-of-return. When obtaining valuable information requires some investment, it can be beneficial for an organization to limit sunk cost investments by utilizing real options strategies. For example, the organization in question might license a Chinese firm to market its products in China for a fixed period of time with an option to form an equity joint venture or acquire that Chinese firm at some future date. In this way, the organization gains information about how its products will sell in China while limiting its initial sunk cost investment. It also puts itself in position to assume greater administrative control over its business activities in China given a favorable reaction to its products.

8. Effectively managing uncertainty requires an understanding of the important sources of uncertainty, as well as the prospective benefits and costs of alternative actions to reduce uncertainty to “acceptable” levels. Some actions will have larger prospective net benefits than others and, therefore, should be incorporated into any overall approach to decision-making under uncertainty. In short, managers need to identify efficient strategies to address uncertainty.