# A FRAMEWORK FOR INTEGRATED RISK MANAGEMENT IN INTERNATIONAL BUSINESS

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**Abstract. Treatments of risk in the international management literature largely focus on particular uncertainties to the exclusion of other interrelated uncertainties. This paper develops a framework for categorizing the uncertainties faced by firms operating internationally and outlines both financial and strategic corporate risk management responses.**

Managing risk is one of the primary objectives of firms operating internationally [Ghoshal 1987]. Nevertheless, current treatments of risk and uncertainty in the international management literature vary in their use of these terms and tend to look at particular categories of risks to the exclusion of the risks mentioned elsewhere in management literature.

The strategic management field lacks a generally accepted definition of risk.[1] The major uses of the term are in reference to unanticipated variation or negative variation (i.e., "downside risk") in business outcome variables such as revenues, costs, profit, market share, and so forth. Managers generally associate risk with negative outcomes [March & Shapira 1987]. The concept of risk as performance variance is widely used in finance, economics, and strategic management. With either the variance or negative variation understandings, "risk" refers to variation in corporate outcomes or performance that cannot be forecast ex ante.

The label "risk" has also commonly been assigned to factors either external or internal to the firm that impact on the risk experienced by the firm. In this sense, "risk" actually refers to a source of risk. Some common examples of risk referring to risk sources are terms such as "political risk" and "competitive risk." Such terms link unpredictability in firm performance to specific uncertain environmental components.

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The use of the term "risk" to refer to uncertain environmental variables that reduce performance predictability, as well as the lack of predictability in firm outcomes itself, can be confusing. Thus, this paper adopts the convention of using the label "risk" to refer exclusively to unpredictability in corporate outcome variables. This usage of risk is consistent with strategy researchers' use of variance (or standard deviation) of accounting-based performance variables such as return on equity and return on assets, stock returns volatility measures (*beta* and unsystematic risk), and measures of deviations from stock analysts' earnings forecasts as measures of corporate risk.[2]

The term "uncertainty" as used in strategic management and organization theory refers to the unpredictability of environmental or organizational variables that impact corporate performance [Miles & Snow 1978; Pfeffer & Salancik 1978] or the inadequacy of information about these variables [Duncan 1972; Galbraith 1977]. Uncertainty about environmental and organizational variables reduces the predictability of corporate performance, that is, increases risk. Uncertainty can arise from exogenous shocks, unforeseeable behavioral choices, or combinations of the two [Lessard 1988].

A firm's strategy deals with the alignment of the organization to its uncertain environment. As such, organizational strategic choices determine a firm's exposure to uncertain environmental and organizational components that impact firm performance. "Exposure" refers to the sensitivity of a firm or project's cash flows to changes in any of a number of interrelated uncertain variables.

A significant shortcoming in much of the existing risk and uncertainty literature is the emphasis on particular uncertainties rather than a multidimensional treatment of uncertainty. This perspective, which can be labeled the particularist view, isolates specific uncertainties to the exclusion of other interrelated uncertain variables. Much of the risk literature in the international management field has focused on either political [Kobrin 1982; Simon 1982, 1984] or foreign exchange uncertainties [Herring 1983; Jacque 1978, 1981]. The finance and insurance literature emphasizes the uncertainties for which hedging or insurance instruments can be developed to manage corporate exposures, but omits some uncertainties encountered in general management strategic decisions.

The particularist approach of analyzing specific uncertainties in isolation from other uncertainties has recently come under criticism. Oxelheim and Wihlborg [1987], for example, argue that unanticipated movements in interest rates, foreign exchange rates, inflation rates, and relative prices are interrelated and jointly make up the context in which to formulate a strategy for managing macroeconomic risk. Shapiro and Titman note:

> Typically, these decisions—such as how much fire insurance to buy, whether to hedge a particular foreign exchange risk, and how much leverage to incorporate within the company's capital structure—are made independently of one another, presumably because each deals with a different source of risk. But because each of these decisions affects the total risk of the firm

> (albeit with different costs and consequences), there are clearly benefits to integrating risk management activities into a single framework [1986, p. 215].

This paper develops an alternative to the suboptimal approach of treating uncertainties in isolation from one another. This alternative—the integrated risk management perspective—takes a general management view giving explicit consideration to numerous uncertainties. The next section develops an organizing framework for categorizing the wide range of interrelated uncertainties relevant to managerial decisionmaking. The subsequent portion of the paper deals with various financial and strategic responses to environmental uncertainties. A final section of the paper elaborates some implications of the integrated risk management perspective for managerial practice, theory development, and empirical research.

## A CATEGORIZATION OF UNCERTAINTIES

Managers may perceive as uncertain (1) general environmental, (2) industry, and (3) firm-specific variables. Each of these categories encompasses a number of uncertain components. Review of a wide range of literature on uncertainty and risk management served to identify the specific uncertain components included in this typology.

The division of environmental and organizational components into these three levels does not, however, mean that managerial perceptions of the uncertainty of these components necessarily vary systematically across the three levels of analysis. That is, not all managers in a particular country have homogeneous perceptions of the general environmental uncertainty nor are the perceived industry uncertainties similar across all managers in a given industry. Managerial perceptions of the uncertainty of each factor can, in fact, vary with individual and firm characteristics [Yasai-Ardekani 1986]. Furthermore, the implications of each uncertainty for firm performance instability differ across individual firms (or projects within firms) depending on their exposures as determined by corporate strategic and financial decisions [Lessard 1988; Robock 1971; Simon 1982; Ting 1988].

### *General Environmental Uncertainties*

The general environmental uncertainties correspond to factors that affect the business context across industries. General environmental uncertainties include political instability, government policy instability, macroeconomic uncertainties, social uncertainties, and natural uncertainties. Table 1 summarizes the general environmental uncertainties discussed in this section and provides a list of examples within each category.

Political uncertainty is generally associated with major changes in political regimes [Shubik 1983; Ting 1988]. Political uncertainty reflects the threats and opportunities associated with potential or actual changes in the political system. Political instability can result from a war, revolution, coup d'état,

**TABLE 1**
**General Environmental Uncertainties**

| |
|---|
| **Political uncertainties** |
| War |
| Revolution |
| Coup d'état |
| Democratic changes in government |
| Other political turmoil |
| **Government policy uncertainties** |
| Fiscal and monetary reforms |
| Price controls |
| Trade restrictions |
| Nationalization |
| Government regulation |
| Barriers to earnings repatriation |
| Inadequate provision of public services |
| **Macroeconomic uncertainties** |
| Inflation |
| Changes in relative prices |
| Foreign exchange rates |
| Interest rates |
| Terms of trade |
| **Social uncertainties** |
| Changing social concerns |
| Social unrest |
| Riots |
| Demonstrations |
| Small-scale terrorist movements |
| **Natural uncertainties** |
| Variations in rainfall |
| Hurricanes |
| Earthquakes |
| Other natural disasters |

or other political turmoil. Democratic changes in governments or heads of state are another cause of political uncertainty that has not been widely acknowledged in the political risk literature.

Policy uncertainty refers to instability in government policies that impact the business community [Ting 1988]. Some authors (e.g., Agmon [1985]; Bunn & Mustafaoglu [1978]) do not distinguish between political and policy uncertainties but use the term "political risk" to encompass both of these uncertainties.[3] The basis for separating the political and policy uncertainty dimensions lies in the observation that changes in governments do not necessarily result in changes in government policies affecting business investment [Brewer 1983; Kobrin 1982] nor does political stability preclude policy uncertainty.

Some of the most relevant types of government policy uncertainties are unanticipated fiscal and monetary reforms, price controls, changes in the level of trade barriers, the threat of nationalization, changes in government

regulation, and barriers to earnings repatriation. Even when policies do not change, managers may be uncertain as to the government's commitment to enforcing existing statutes. Multinational firms face government policy uncertainties in their home country as well as in host countries.

Increasingly, international and domestic events interact to influence policy uncertainty. For example, the uncertainties associated with management of foreign debt in developing countries reflect interactions among negotiators from banks, indebted countries, and multilateral organizations such as the International Monetary Fund. The outcomes of such complex interactions are difficult to predict and have the potential to cause major destabilizing political, social, and economic consequences.

Another area of policy risk that is seldom mentioned in the management literature is the role of government policy in the provision of public goods. Inadequate provision of public services by state-owned enterprises or publicly regulated industries such as transportation or communication have serious negative implications for private sector productivity. Firms operating in the reforming centrally planned economies and in less-developed countries frequently encounter uncertainties due to the lack of dependable public utility, communication, and transportation infrastructure.

Macroeconomic uncertainty is a broad concept encompassing fluctuations in the level of economic activity and prices [Oxelheim & Wihlborg 1987]. Price fluctuations may take the form of general price inflation or movements in the relative prices of inputs (such as raw materials or labor) and consumer goods. Often associated with the movements in aggregate production and prices are uncertain movements in exchange rates and interest rates. Deviations from purchasing power parity exchange rates can create input sourcing and product pricing arbitrage opportunities for multinational firms.

Social uncertainty follows from the beliefs, values, and attitudes of the population that are not reflected in current government policy or business practice [Dunn 1983]. Social uncertainty results from the difficulties inherent in predicting the likelihood of collective action and the direction of such action when people are faced with discrepancies between their own values and those embodied in the institutions impacting their lives. Social uncertainty can be a precursor to political and policy uncertainty. Social uncertainty occurs in contexts characterized by social unrest, riots, demonstrations, or small-scale terrorist movements. If such movements subsequently develop into threats to the government, political instability results. The justification for separating the political and social dimensions of general environmental uncertainty is that they pertain to two distinct stakeholder groups [Freeman 1984]—government and society at large.

Society may bypass existing government policy channels and appeal directly to business for reforms. The potential for collective action demanding socially responsive behavior from the business sector is most likely to occur when widely adopted social values provide a basis for questioning the legitimacy

of existing business practices. In such cases, the business sector may respond proactively to the social pressures prior to government policy pressure.

The political, policy, economic, and social uncertainties within the general environment are clearly interdependent. The distinctions between these uncertainties may, however, be useful for managerial and scholarly analytical purposes. The broad macro-sociopolitical models (cf., Haendel, West & Meadow [1975]; Johnson [1981]; Knudsen [1974]) tend to express political and policy instability as functions of various economic and social forces. The causality between these variables is not, however, unidirectional. Rather, political, policy, economic, and social variables engage in complex interactions that are difficult to express in terms of simple causal models.

A fifth general environmental uncertainty dimension is natural uncertainties. This category includes natural phenomena that impact economic output. While natural uncertainty is most clearly evident in the agricultural sector where weather patterns greatly influence productivity, natural disasters (e.g., hurricanes or earthquakes) can impair numerous business functions and significantly decrease the productive capacity of firms operating in an affected region.

In analyzing the general environmental uncertainties, the country unit of analysis can be relevant. Indeed, a number of international risk assessment services regularly generate rankings of country investment climates. An examination of Table 1, however, indicates a number of uncertainties that tend to result in uncertainty spillovers across national borders. For example, political, economic, and social turmoil often cannot be confined within national borders. The relevance of the country level of analysis for evaluating general environmental uncertainties depends on the extent to which uncertainties are uncorrelated across countries. The extent to which general environmental uncertainties spill over to other countries depends on the degree of international interdependence of countries' political, economic, and social systems.

### *Industry Uncertainties*

While there is a rather extensive literature on the general environmental uncertainties, industry-level uncertainties have not been as fully explored. Industry dynamics involve three major classes of uncertainties: input market uncertainty, product market uncertainty, and competitive uncertainty. Table 2 summarizes the industry uncertainties.

Input market uncertainty refers to the industry-level uncertainties surrounding the acquisition of adequate quantities and qualities of inputs into the production process. Input market uncertainty may arise from either shifts in producer supplies or fluctuations in other users' demand for the input. Uncertainty surrounding the acquisition of inputs is particularly likely to occur in situations where there are only a few input suppliers. Such situations can arise when supplying the input involves investment in specialized machinery,

**TABLE 2**
**Industry Uncertainties**

| |
|---|
| **Input market uncertainties** |
| Quality uncertainty |
| Shifts in market supply |
| Changes in the quantity used by other buyers |
| **Product market uncertainties** |
| Changes in consumer tastes |
| Availability of substitute goods |
| Scarcity of complementary goods |
| **Competitive uncertainties** |
| Rivalry among existing competitors |
| New entrants |
| Technological uncertainty |
| Product innnovations |
| Process innovations |

equipment, or organizational skills. When a supplier has invested in assets that are specialized to the input needs of a particular industry, competition in the input market is limited. As such, the potential exists for price and quantity manipulation by the supplier.

In the international environment, input uncertainty can be closely related to the general environmental uncertainties discussed earlier. Recent examples of the interrelationships between general environmental uncertainties and input uncertainties include the supply uncertainties surrounding the lack of multilateral trade agreements (e.g., the unclear outcome of the GATT negotiations) and political instability affecting production schedules (e.g., Middle East oil production).

Product market uncertainty refers to unexpected changes in the demand for an industry's output. Such shifts may be due to changes in consumer tastes or the availability of substitute products. The lack of availability of complementary goods, such as replacement parts for automobiles, can also adversely impact demand. The unpredictability of domestic and foreign government policies toward imported goods directly impacts product market uncertainty. This relationship is obvious in the context of negotiating and implementing multinational free trade zones and the opening up of new foreign markets (e.g., the former Warsaw Pact nations).

Competitive uncertainty is a broad category covering the uncertainties associated with rivalry among existing firms and potential entrants into the industry. Competitive uncertainty, therefore, has to do with the inability to predict the amount and type of goods available in the product market. Porter [1980, 1985] provides an extensive discussion of the strategic moves firms use to gain competitive advantage in an industry.

Innovations affecting an industry's product or production process pose a threat because they can upset established patterns of competition and coordination

among firms. Technological uncertainty, a dimension of competitive uncertainty, results from not knowing when actual or potential rivals will introduce innovations that upset the patterns of competition in an industry.

### *Firm Uncertainties*

A third set of uncertainties is associated with firm-specific factors. The primary categories of firm-specific uncertainties are operating, liability, research and development, credit, and behavioral uncertainties. Table 3 presents an overview of firm-specific uncertainties.

Operating uncertainty includes three subcategories of uncertainties: labor uncertainty, firm-specific input supply uncertainty, and production uncertainty.

Uncertainty regarding specialized labor or other inputs is often firm-specific rather than having an effect on the industry in general. Labor uncertainties include changes in employee productivity due, for example, to labor unrest or strikes. Providing employees with a safe atmosphere in which to work reduces the personal risk to workers as well as the threat of injury-related lawsuits directed at the firm.

Raw materials shortages, quality changes in inputs, and spare parts restrictions are all examples of firm operating uncertainties in the input supply category. Input supply uncertainties are likely to be greatest when a single supplier or organized group provides critical inputs to the firm. The indeterminant nature of bilateral negotiations between a single purchaser and a single supplier has been developed in the microeconomics literature (see, e.g., Mansfield [1979]). Williamson [1975] refers to the negotiations between a firm and a specialized supplier as a situation of "small-numbers bargaining." Williamson explains firms' internalization of the supplier function as an effort to reduce the possibility of opportunistic behavior by monopsonistic suppliers.

Production uncertainty is the third type of operating uncertainty. Production uncertainty includes variations in output due to machine failure. Also included in production uncertainty are other random factors, such as accidents, that disturb the production process.

Liability uncertainties are associated with unanticipated harmful effects due to the production or consumption of a company's product. Product liability uncertainty relates to unanticipated negative effects associated with the use of a product that can result in legal actions against the producer. Firms may also be held legally responsible for certain external effects such as emissions of contaminants into the environment.

In addition to technological uncertainty at the industry level which was discussed earlier, individual firms investing in research and development encounter uncertainty about the relations between their R&D investments and new product or process outputs. R&D uncertainty is the lack of perfect foresight as to the connections between a firm's own R&D expenditures

**TABLE 3**
**Firm Uncertainties**

| |
|---|
| **Operating uncertainties** |
| Labor uncertainties |
| Labor unrest |
| Employee safety |
| Input supply uncertainties |
| Raw materials shortages |
| Quality changes |
| Spare parts restrictions |
| Production uncertainties |
| Machine failure |
| Other random production factors |
| **Liability uncertainties** |
| Product liability |
| Emission of pollutants |
| **R&D uncertainty** |
| Uncertain results from research and development activities |
| **Credit uncertainty** |
| Problems with collectibles |
| **Behavioral uncertainty** |
| Managerial or employee self-interested behavior |

and the actual introduction of a new product or process. When investing in R&D there is uncertainty surrounding the time frame for completing the project and the nature of the project's output.

Credit uncertainty involves problems with collectibles. Default by clients on their debts to a firm can be a direct cause of variation in the firm's income stream. The high levels of uncollectible loans accumulated by private banks lending to developing countries is an obvious case of adverse performance resulting from credit uncertainty. Problems associated with the management of collectibles is not, however, limited to the financial sector.

The final category of firm-specific uncertainties is associated with agency relationships within a firm. Jensen and Meckling [1976] define an agency relationship as "a contract under which one or more persons (the principal[s]) engage another person (the agent) to perform some service on their behalf which involves delegating some decision-making authority to the agent" (p. 308). One such relationship is that between a firm's owners and the managers they employ [Fama 1980; Fama & Jensen 1983]. Jensen and Meckling show that managers often face incentives to increase their personal welfare at the expense of the firm's owners. This tendency toward personally beneficial behavior decreasing the overall value of the firm is not limited to top management. Rather, opportunistic behavior by agents can occur at any level of the organizational hierarchy. The standard response to agency problems is to adjust the organizational incentive structure to align individual interests with organizational objectives. This may require changes in internal controls and performance evaluation procedures. Following Williamson

[1985], the uncertainty attributable to opportunism is termed "behavioral uncertainty."

Multinational operations can exacerbate the problems of designing appropriate control systems for monitoring managerial performance [Lessard & Lorange 1977]. Disparities in foreign currency values from parity levels, hyperinflation, and deviations in internal MNE transfer prices from market shadow prices (in order to take advantage of tax regime differentials across countries) add to the complexities of monitoring managerial performance in the international context [Jacque & Lorange 1984b; Lessard 1979].

In the above description of operating uncertainty, bilateral negotiations with organized labor was described as an input supply uncertainty. In such a case, considerable uncertainty exists as to the terms of the relationship between the firm and labor as a collective bargaining unit. Behavioral uncertainty, on the other hand, refers to self-serving actions on the part of managers or employees that breach their explicit or implicit contractual relationships with the firm. The terminology introduced in this section allows us to distinguish uncertainties associated with the labor force in general—labor uncertainty—and those associated with individuals who take advantage of the firm's resources for personal benefit—behavioral uncertainty.

## FINANCIAL AND STRATEGIC RESPONSES TO UNCERTAINTIES

The uncertainty classification scheme developed in the previous section clarifies the relevant dimensions of uncertainty faced by firms operating internationally. This section provides a brief overview of potential firm responses to deal with the identified uncertainties.

Financial risk management and changes in firm strategy are two approaches to managing exposure to environmental uncertainties.[4] Financial risk management techniques reduce corporate exposures to particular risks without changing the firm's strategy. Strategic responses generally impact a firm's exposure across a wide range of environmental uncertainties. Since financial risk management techniques have been discussed extensively in the finance and insurance literature, greater attention is given here to strategic responses to uncertainties. The various managerial uncertainty responses are summarized in Table 4.

### *Financial Risk Management*

The principal financial risk-reduction techniques are purchasing insurance and buying and selling financial instruments (forward contracts, futures contracts, swaps, and options).[5] A futures or forward contract requires the seller of the contract to make delivery of a pre-specified quantity of goods or assets at some fixed time in the future. The ability to lock in a fixed price is the key risk-reducing feature of futures and forward contracts for both buyers and sellers. Financial hedging instruments are widely used by multinational enterprises to manage foreign exchange risk.

## TABLE 4
## Organizational Responses to Uncertainties

- **Financial risk management**
  - Forward or futures contracts
  - Insurance
- **Strategic management**
  - Avoidance
    - Divestment
    - Delay new market entry
    - Low uncertainty niches
  - Control
    - Political activities
    - Gain market power
    - Exchange of threats
    - Vertical integration
    - Horizontal mergers and acquisitions
  - Cooperation
    - Long-term contractual agreements with suppliers or buyers
    - Voluntary restraint of competition
    - Alliances or joint ventures
    - Franchising agreements
    - Licensing and subcontracting arrangements
    - Participation in consortia
    - Interlocking directorates
    - Interfirm personnel flows
  - Imitation
    - Imitation of product and process technologies
    - Follow other firms in moving into new markets
  - Flexibility
    - Diversification
      - Product diversification
      - Geographic diversification
    - Operational flexibility
      - Flexible input sourcing
      - Flexible work force size
      - Flexible work force skills
      - Flexible plants and equipment
      - Multinational production

While according to finance theory firms can hedge their exposures to foreign exchange or commodity price movements in the forward and futures markets and insure against a wide variety of losses, the extent to which the necessary instruments and markets have developed varies from country to country. Furthermore, even in the countries with the widest range of financial market instruments, no hedging or insurance instruments exist to reduce exposures to many of the uncertainties outlined in the previous section. The lack of a one-to-one correspondence between firm exposures to uncertainties and financial market hedging and insurance instruments points out the need to incorporate strategic responses as well as financial tactics in managing corporate risk.

The nonexistence of markets for hedging exposures to many uncertain environmental contingencies is itself a result of uncertainty. For example, futures markets are less likely to exist for products that have a great deal of quality uncertainty. Insurance markets fail due to simple lack of information to make actuarial assessments of the risks or due to asymmetric information about the behavior and exposure of the parties seeking insurance. Such information asymmetry gives rise to problems of adverse selection which can, in the extreme, eliminate insurance coverage for an entire class of exposures [Akerlof 1970]. Screening or self-selection of buyers may mitigate the problem of "non-existent" markets for transferring and pooling risk.

Firms purchase insurance to protect against property and casualty losses and product liability suits. Private insurers, government-sponsored agencies (such as the U.S. Overseas Private Investment Corporation), and multilateral organizations (for example, the Multilateral Investment Guarantee Agency) provide insurance policies protecting foreign direct investments against expropriation of assets, civil strife, war, and currency inconvertibility. With the exceptions of product liability and worker disability, insurance coverage for exposures to industry and firm uncertainties (see Table 2 and 3) is limited.

The cost associated with purchasing insurance is the portion of the premium which exceeds the expected value of the firm's loss. This payment in excess of the expected value of the loss covers the insurance company's operating expenses as well as the implicit costs of moral hazard and adverse selection [Shapiro & Titman 1986].

Where the possibilities for forward and futures contracting or insuring against possible losses are limited because of a lack of market development, the risk management focus shifts from financial practices to strategic moves that reduce exposures to environmental uncertainties.

### *Strategic Risk Management*

While the risk-reduction properties of forward contracts and insurance have been rigorously explored in the finance and insurance literature, the risk management implications of many corporate strategies have received relatively little attention. There are, nevertheless, a number of strategic moves that can potentially mitigate the risks associated with the uncertainties outlined earlier. The five "generic" responses to environmental uncertainties are avoidance, control, cooperation, imitation, and flexibility (Table 4).

Uncertainty *avoidance* occurs when management considers the risk associated with operating in a given product or geographic market to be unacceptable. For a firm already active in a highly uncertain market, uncertainty avoidance involves exiting through divestment of the specialized assets committed to serving the market. For firms not yet participating in a market, uncertainty avoidance implies postponement of market entry until the industry uncertainties decrease to acceptable levels [Wernerfelt & Karnani 1987]. Firms

can avoid uncertainty through a niche strategy of participating only in low uncertainty markets.

Firms may seek to *control* important environmental contingencies to reduce uncertainties [Cyert & March 1963; Mascarenhas 1982].[6] Research by MacCrimmon and Wehrung [1986] indicates that managers are predisposed to trying to control uncertain variables rather than passively treat the uncertainties as constraints within which they must operate. Examples of control strategies include political activities (e.g., lobbying for or against laws, regulations, or trade restraints), gaining market power, and undertaking strategic moves that threaten competitors into more predictable (and advantageous) behavior patterns [Allaire & Firsirotu 1989; Ring, Lenway & Govekar 1990; Vernon 1983]. The use of market power to deter entry and control competitors is the primary focus of Porter's [1980, 1985] discussions of uncertainty management. Mascarenhas [1982] includes influencing consumers through advertising and promotions as another example of a control response to uncertainty. Vertical integration is an attempt to control input or demand uncertainties [Allaire & Firsirotu 1989; Mascarenhas 1982; Moran 1983; Pennings 1981; Vernon 1983; Walker & Weber 1987; Williamson 1975]. Horizontal mergers and acquisitions reflect managerial attempts to control competitive uncertainties through adjusting industry structure [Pennings 1981; Pfeffer & Salancik 1978].

*Cooperation* can be distinguished from control responses in that cooperative responses involve multilateral agreements, rather than unilateral control, as the means for achieving uncertainty reduction. Uncertainty management through coordination results in increased behavioral interdependence and a reduction in the autonomy of the coordinating organizations [Pfeffer & Salancik 1978]. Cooperative strategies for reducing uncertainty include long-term contractual agreements with suppliers or buyers [Aaker & Mascarenhas 1984; Allaire & Firsirotu 1989; Mascarenhas 1982; Vernon 1983], voluntary restraint of competition [Allaire & Firsirotu 1989; Mascarenhas 1982], alliances or joint ventures [Allaire & Firsirotu 1989; Pennings 1981; Pfeffer & Salancik 1978; Ring, Lenway & Govekar 1990; Root 1988; Vernon 1983; Wernerfelt & Karnani 1987], franchising agreements [Allaire & Firsirotu 1989], technology licensing agreements [Pennings 1981; Vernon 1983], and participation in consortia [Vernon 1983]. Overlapping board membership (i.e., interlocking directorates) and personnel flows can facilitate interfirm coordination [Pennings 1981; Pfeffer & Salancik 1978].

The institutionalists [DiMaggio & Powell 1983] assert that under conditions of uncertainty firms may resort to *imitation* of rival organizations' strategies as a means of coping with uncertainty. While such behavior can result in coordination among industry rivals, the basis of this coordination is clearly distinct from that under control or cooperation strategies. In this case, no direct control or cooperative mechanism is used. Rather, an industry leader is able to predict the response of rivals because their responses are merely

lagged imitations of its own strategic moves. Imitation strategies (''follow-the-leader'' behaviors) involve pricing and product strategies that follow those of an industry leader. Follow-the-leader behavior has, for example, been proposed as an explanation for why firms in oligopolistic industries enter the same international markets [Aharoni 1966; Barlow & Wender 1955; Vernon 1983].

While imitation of product and process technologies may be a viable low-cost strategy in some industries [Mansfield, Schwartz & Wagner 1981], uncertainty about the underlying technology of competing firms may preclude such a strategy [Lippman & Rumelt 1982].

A fifth general category of strategic responses to environmental uncertainties involves managerial moves to increase organizational *flexibility*. According to Aaker and Mascarenhas, ''Strategic flexibility may be defined as the ability of the organization to adapt to substantial, uncertain, and fast-occurring (relative to required reaction time) environmental changes that have a meaningful impact on the organization's performance'' [1984, p. 74]. Flexibility increases when firms decrease the cost of organizational adaptation to uncertain environmental factors [Porter 1985]. By contrast, Harrigan states, ''Firms face strategic inflexibility when they cannot redeploy their assets without friction'' [1985, p. 125].

Unlike control and cooperation strategies which attempt to increase the predictability of important environmental contingencies, flexibility responses increase internal responsiveness while leaving the predictability of external factors unchanged. The most widely cited example of flexibility in the strategy literature is product or geographic market diversification [Aaker & Mascarenhas 1984; Allaire & Firsirotu 1989; Eppink 1978; Krijnen 1979; Mascarenhas 1982; Milliken 1987; Vernon 1983]. Diversification reduces firm risk through involvement in various product lines and/or geographic markets with returns that are less than perfectly correlated. There is some evidence that related product diversification is more likely to achieve favorable risk/return performance than unrelated diversification [Bettis & Mahajan 1985]. Rugman [1979] found that multinational diversification decreases the variability of firms' rates of return on capital.

Diversification of suppliers creates options for input sourcing, thus enhancing the firm's capability to respond to input fluctuations [Aaker & Mascarenhas 1984]. Flexible sourcing of materials and strategic stockpiling of inputs are means of limiting a firm's exposure to the risks associated with dependence on a single supplier. Indeed, one significant source of competitive advantage for multinational enterprises is their flexibility to adjust resource transfers between their headquarters and subsidiary units when relative prices change across countries [Kogut 1983].

Flexibility is also described in terms of the speed of design and volume changes in manufacturing operations [Krijnen 1979; Swamidass & Newell 1987; De Meyer, Nakane, Miller & Ferdows 1989]. Response speed is, in

turn, a function of factors such as work force flexibility, and plant and equipment flexibility [Aaker & Mascarenhas 1984; Mascarenhas 1982]. Work force flexibility can be seen in the generalization of production workers' skills, greater use of temporary labor, on-going training [Nemetz & Fry 1988], and short notice termination clauses in worker contracts [Mascarenhas 1982]. Operational flexibility is sought through the substitution of general purpose technology for specialized commitments.

Flexible firms are able to take advantage of the opportunities presented by short-term movements in the price of inputs and products. For example, currency undervaluation presents the opportunity to increase foreign market share through exports. Underpricing in the capital markets offers opportunities for advantageous acquisitions of other companies or capital for internal growth. Flexibility may also be exhibited in the ability to pass through changes in the price of inputs or in the general level of prices to consumers through frequent price adjustments [Jacque & Lorange 1984a].

## IMPLICATIONS OF THE INTEGRATED RISK MANAGEMENT PERSPECTIVE

### *Uncertainty Trade-offs*

A major strength of the integrated risk management perspective is that it facilitates explicit recognition of trade-offs between exposures to various uncertainties. The reduction of uncertainty in one dimension may result in increased exposure to another uncertainty. For example, a firm with receivables denominated in a foreign currency may wish to hedge its foreign exchange exposure. Such a hedge can be undertaken by selling forward the foreign currency to be received for home country currency. This effectively eliminates the foreign country currency risk exposure by fixing the exchange rate at which the foreign currency will be exchanged for domestic currency. However, this hedging increases the firm's exposure to unanticipated movements in the value of the home country currency due to acceleration in the domestic inflation rate. Thus, there are potential risk-reducing diversification benefits from denominating collectibles in a number of different currencies.

A similar trade-off in risk management strategies is evident when trying to determine the level of R&D expenditures to undertake. Such investment exposes the firm to R&D uncertainty because of the unpredictable relation between R&D investment and the value of the resulting product and process innovations. Nevertheless, investment in R&D may be critical to maintaining a firm's competitiveness. Failure to invest in R&D could expose the firm to potentially severe competitive threats as other firms progress technologically.

Hedging foreign currency transaction exposure and investment in R&D are examples of firm strategic decisions involving trade-offs between exposures to environmental uncertainties within particular uncertainty categories. In the case of hedging foreign currency transaction exposure, the trade-off is

between exposures to foreign exchange and macroeconomic uncertainties. In the latter case, firms undertake uncertain R&D investment in order to mitigate competitive threats.

Uncertainty trade-offs can also occur across the three levels of analysis identified earlier—general environment, industry, and firm-specific uncertainties. Consider, for example, the suggestion that firms faced with input market uncertainty should backward integrate in order to control the supply of critical inputs. Viewed exclusively at the industry level of analysis such a prescription seems to make sense. At the general environmental level, however, such a prescription may not be reasonable if the firm is faced with high political uncertainty. Under such conditions, vertical integration may increase both the magnitude and the probability of a loss of assets due to expropriation. Shifting down a level of analysis from the industry to the firm-specific level, internalization of the supplier function can result in increased behavioral uncertainty since the supplier would no longer be subject to the discipline of market competition. Hence, the implications of vertical integration for firm risk are actually much more complex than an uncertainty assessment constrained to a single level of analysis would suggest.

Cooperative strategies, which may effectively alleviate industry-level uncertainties, frequently involve increased exposure to opportunistic behavior by the cooperating parties. For example, the establishment of international joint ventures often is not a stable risk-reduction strategy because of divergent interests among the partners [Franco 1971].

Because the various uncertainties are interrelated, formulating corporate responses cannot be adequately handled by delegating risk management responsibilities to functional or divisional units. Strategic decisions have risk implications that cut across the many subunits within an organization. Thus, if risk management is delegated to the subunits, the aggregation of their responses to perceived uncertainties is likely to be inferior to corporate-level integrated risk management responses giving explicit recognition to exposure trade-offs.

### *Managerial Implications*

The framework developed in this paper expands the scope of corporate risk management activities. Risk management is not limited to the assessment of exposure to losses and the application of appropriate financial risk management practices such as insurance and hedging instruments. Rather, financial and strategic responses are interrelated in such a way that decisionmaking in either area to the exclusion of the other would be suboptimal. In formulating risk management responses when faced with exposures to uncertainties, corporate decisionmakers can expand their repertoire of possible responses by considering both financial and strategic responses.

Not all uncertainty exposures should be reduced. Rather, the firm should attempt to establish an uncertainty exposure profile that optimizes its returns

for the risk assumed. Investment in financial and strategic responses to uncertainties should only take place up to the point where the marginal benefits to the firm of reducing uncertainty are equal to the marginal costs. If the cost of reducing the uncertainty exposure in a particular dimension exceeds the benefits of uncertainty reduction, no investment is warranted.[7]

New investment opportunities need to be assessed in terms of their implications for the firm's general uncertainty profile. While a project's performance viewed in isolation may be deemed very unpredictable along many different uncertainty dimensions, if the project's returns are expected to have low (or negative) correlations with the existing firm projects, such an investment can actually reduce the firm's overall income stream variability.

Ideally, a firm could, as part of the strategic planning process, develop a comprehensive uncertainty profile encompassing each of the uncertainty dimensions. Ongoing clarification of the nature and extent of the uncertainties a firm faces can take place through environmental surveillance and forecasting activities. An assessment of the uncertainties at the general environmental, industry, and firm levels can point to opportunities and threats to which strategic and financial responses can be formulated. Alternative strategies need to be considered (either quantitatively or qualitatively) in terms of their implications for the firm's comprehensive uncertainty profile.

### *Research Implications*

In addition to the implications for managerial practitioners, the integrated risk management framework developed in this paper has implications for international business and strategic management research. The typologies of uncertainties and firm risk management responses provide a basis for developing and empirically testing specific hypotheses relating multiple uncertainties to strategic responses by international business firms. The list of strategic responses to uncertainties indicates a broad range of firm activities, many of which have not been studied as risk management strategies.

Researchers need to begin to test more complex contingency relations between the multiple uncertainty dimensions and corporate strategic responses. The development of such hypotheses goes beyond the simplistic approach found in much of the existing literature of treating uncertainty as a single construct or isolating a particular type of uncertainty to the exclusion of other uncertainties. That is, much of the strategic management, organization theory, and international management literature on risk and uncertainty is imprecise in its theoretical statements about organizational response to uncertainties because of its failure to specify the particular uncertainties of interest. As already noted, organizations do not respond to uncertainty as a general environmental phenomenon. Rather, firm responses to uncertainties involve trade-offs between various uncertainties. For instance, based on the example of backward vertical integration mentioned earlier, it would be reasonable to hypothesize a positive relation with input supply uncertainty but a negative relation with political and policy uncertainty.

The framework developed in this paper may also serve as a starting point for further theory development integrating the diverse streams of uncertainty and risk literature. Theory development can be enhanced by spanning theoretical disciplines to gain an appreciation for the understanding and approaches to risk and uncertainty in other fields. The field of international management has already been strongly influenced by the treatments of uncertainty in international finance and transaction cost theories. The integrated approach to risk management incorporates transaction cost concerns about behavioral uncertainty into a broader framework in which firms consider numerous uncertainties in making strategic decisions. More rigorous theory development is also needed to elaborate the complementary roles of financial and strategic responses to uncertainties.

Finally, risk has not been widely used as an outcome measure in assessing the implications of alternative corporate strategies. The greatest interest in risk as an outcome of corporate strategic decisions has been in the product and geographic diversification literature. These studies have looked at risk, along with other outcome measures, as a function of expansion into related or unrelated product lines and international diversification into foreign markets. The integrated risk management perspective carries with it the implication that a wide range of corporate strategic responses impact firm risk. Researchers can make significant contributions by incorporating risk as an outcome variable in empirical strategy research.

## CONCLUSION

The isolated treatment of uncertainties in the existing management literature does not provide an adequate basis for analyzing the risk implications of strategic decisions. In contrast, the integrated risk management perspective provides a framework for identifying and assessing the many types of uncertainties relevant to strategy formulation. This framework offers a basis for comprehensive assessment of uncertainty exposures and explicit consideration of the uncertainty trade-offs associated with alternative firm strategies. The framework also points out the need to specify more precisely hypothesized contingency relations between environmental uncertainties and firm strategies. Researchers need to incorporate risk as an outcome variable in studying a broad range of corporate strategies.

## NOTES

1. Baird and Thomas [1985] present a discussion of various uses of the term "risk" in the strategic management literature.

2. For a review of the risk measures used in strategy research see Miller and Bromiley [1990].

3. For a more detailed discussion of the various uses of the term "political risk" see Fitzpatrick [1983].

4. This article distinguishes financial and strategic responses to uncertainties. Shapiro and Titman [1986] use the terms "financial" and "real" to distinguish these same concepts. Ting [1988] makes this distinction using the terms "defensive" and "integrative" risk management. Using the term

"financial" risk management avoids the potentially confusing association of the adjective "defensive" with the defender strategy described by Miles and Snow [1978].

5. Smith, Smithson & Wilford [1990] present a thorough introduction to the four major categories of financial risk management instruments.

6. The managerial response to uncertainty of trying to control key environmental variables is identified by a number of different labels. Mascarenhas [1982] is one of the few writers that uses Cyert and March's [1963] label of "control" in describing this set of managerial responses to uncertainty. Porter [1985] refers to " influence" strategies. Ackoff [1975] uses the term "external action." Allaire and Firsirotu [1989] assign the label "power response." Jauch and Kraft [1986] prefer the term "external uncertainty reduction."

7. While this optimization rule is simple to state, its application in practice is complicated by the divergent assessments of the benefits of risk reduction among different stakeholder groups. For further discussions of divergent stakeholder perspectives on risk see Cornell and Shapiro [1987] and Miller and Bromiley [1990].

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