Managing Risks of Investments in Developing Countries

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Managing Risks of Investments in Developing Countries

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ABSTRACT

This paper presents the key considerations for managing the risks of investments in developing countries. These considerations are important for the assistance strategies of the World Bank and other official financing agencies that are designed to bring in private investment to developing countries, even though the loans of these agencies are guaranteed by the national governments of their borrowers.

The paper focuses on the requirements of a sound risk management strategy for commercial entities by:

- outlining the extent of all possible risks to an enterprise, especially the potentially large indirect costs arising from a loss of productive capacity;
- providing information on the latest trends in risk management, including current risk mitigation techniques;
- identifying areas where private and official insurers can protect project owners and financiers from commercial and political risks;
- demonstrating ways in which risk management can reduce financial risk exposure and promote a risk management culture in a project organization;
- examining unprotected gaps in insurance coverage which might affect the ability of borrowers to service loans; and
- reviewing risk management issues for major infrastructure developments and illustrating them in case studies on a hydroelectric project and a motorway concession project.

In addition to stressing the importance of risk management, the overall message of the paper is that the commercial insurance market is able to facilitate private investment in developing countries because of its flexibility and range of risk mitigation techniques, and that the role of this market complements the coverage offered by official insurance programs.
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Section I

Introduction
Introduction

Anthony Churchill

We have before us a very interesting seminar on managing risks of investments in developing countries, an issue which arises increasingly as we get the private sector more involved in World Bank projects. In the Bank we have not been very good at handling risk in a number of dimensions, especially our project choices. Our projects in the electric power field, particularly hydroelectric projects, have often turned out poorly in terms of costs and schedules. We clearly estimated incorrectly many times—what looked like nice reliable projects turned out to be fairly risky projects. Many of our project choices have failed to take risk into account before the loans were signed, making it difficult to privately insure these projects. I would encourage the Bank to apply the risk analysis techniques discussed today to identifying projects as well as to assessing projects’ insurance needs.

My own observation from working with many different types of Bank projects is that we have not evaluated risks very well. Recently we looked at our investments in the power sector, and we discovered that we had made the same mistakes too many times to write them off as random events. We failed to take risks into account, and the costs were borne by our customers—some of the poorest countries in the world. I would like to bring to your attention the special moral hazard the Bank faces with respect to risks. I am not aware of any staff member ever being censured for producing bad estimates on a project or for having forecasts that went wrong. Bad projects, bad estimates, currency fluctuations, and cursory risk and insurance assessments all hit our customers, not us. Our responsibility for approving the investment of other people’s money presents us with this special moral hazard. From the information presented today we should have a better appreciation for what risks are, how they can be covered, and how we as an institution can deal with these risks.

A lot of people basically ask me, “how can we make investments in developing countries without taking any risks?” In other words, they want to try and cover all risks with insurance. And I can’t help but wonder, are we a more risk-averse society today than our forebears were 50 or 100 years ago? In the 19th century huge infrastructure investments were undertaken in China, Latin America, and the United States, all of which involved very high risks. Because of these high risks, investors either lost a great deal or won a great deal. Why are today’s businessmen unwilling to take risks? Perhaps it is because project designers, host governments, and lending institutions are not properly addressing risk and creating an investment-friendly environment. Given this aversion to risk by today’s investors, governments should avoid uncertainty in pricing and weaknesses in the regulatory structure, and project sponsors should thoroughly examine all risks associated with the endeavor and develop a plan for dealing with them.
Because World Bank loans are guaranteed by governments, it is reasonably natural for Bank staff to consider unimportant the risks behind Bank-supported projects. In order to encourage private investment in Bank-supported projects, however, risks and insurance must be of primary concern. Private bankers certainly look for insurance, whether it is in the political risk field or other areas, to facilitate investment in projects in the developing world. If there is no insurance on a project, or if efforts have not been made to reduce risk, it is vital that the project be fully costed. Even when insurance is not specifically itemized as a cost, risk exposure must be accounted for in the total project cost. Making the individual enterprises more risk conscious and making sure that minimum standards have been met or exceeded have the added benefit of reducing loss and waste in the developing world. There would be lower losses in individual enterprises, less drain on governments guaranteeing the loans, and more money to reinvest in new projects. These benefits could result in a more efficient use of the World Bank's resources.

This seminar has been arranged in order to help Bank staff meet the goal of bringing in private sector investment through proper treatment of risks. Therefore, the objectives of this seminar are (i) to outline for World Bank staff the latest trends in risk management; (ii) to identify areas where private and government insurers can protect principals and lenders; (iii) to demonstrate ways in which risk management can reduce financial risk exposure and to promote a risk management culture; (iv) to examine unprotected gaps in insurance coverage which might affect the ability of borrowers to service loans; and (v) to derive practical lessons from case studies.

I would like to introduce the seminar by highlighting a few points that are worth emphasizing. One of the questions we address is whether we and our organizations are more risk averse today. We propose that rather than risk averse, we should be risk conscious. If we as investors, sponsors, and insurers know what risk is and how it affects us, then we know how to handle it, and we can have confidence in retaining some of it.

A second point is that local project-country regulatory standards for safety, environmental controls, and the like are often the minimum standards, and that project designers and engineers tend to work to these minimum standards. This can be highly risky. New environmental legislation is being introduced, and designers and engineers need to be aware of risks by anticipating changes that are likely in current standards. They should utilize designs and processes that are cleaner and more efficient than are currently demanded. Insurers will normally only cover projects for accidental events within current environmental laws, not for expenses
incurred from changes in legislation. The National Westminster Bank in England, which found itself bearing tremendous environmental risks from repossessed companies or assets that were not kept to sufficiently high environmental standards by their operators, has addressed this problem by appointing an environmental team to make sure their customers' environmental standards are on the safe side.

The extent of contractor liability is another important issue. The World Bank's standard contract, based on the FIDIC model, does not limit the contractor's liability, but there is currently a limit in the private insurance market of around $50-100 million. Rather than placing unlimited responsibility on contractors (which they might not be able to finance), another option would be to set the limit at a level that can be bought in the insurance market. Perhaps the insurance market can be persuaded to respond with higher limits, which would make all parties more comfortable. Performance bonds will also be discussed as another mechanism to ensure reliable contracting. The Bank could require a performance bond from a contractor, assuming it has the financial strength to obtain one.

Bilateral Investment Treaties are an intriguing risk management mechanism, and the World Bank and other organizations should encourage their use. These treaties could improve investors' options for handling the political risks they face, whether these risks are retained or transferred.

With mergers and acquisitions and privatization, we strongly recommend that risk audits be part of the due diligence process.

A key feature about Eastern Europe and some developing countries is the need to deal adequately with the risks of loss of profits from business interruption, and thus to protect revenues. Since this is a relatively unknown insurance product in these countries, and since it could improve debt servicing, the World Bank could serve its own interests as well as those of Eastern European countries by promoting loss of profits cover.

We will bring out the important role project owners play in the principal control of construction risks. They are responsible for minimizing gaps and making the project more cost effective. If they are successful, less money will be spent on lawyers resolving disputes.

Finally, provided that good information is available about a project's risks, the insurance market can often provide a good risk financing solution. It is worthwhile to produce special information to help the insurance industry find better solutions to risk exposure.
Section II

Risk Management and the Commercial Insurance Market
Topics Covered in Section II:

- Introduction to Insurance
- Features of Insurers and the Insurance Market
- Definition of Risk Management
- The Role of the Insurance Broker
- Risk Auditing/Risk Assessment
- Risk Ranking
- Risk Control and Reduction
What Are Risk Management and Insurance?

Douglas Masham

There are a number of misconceptions about insurance that are worth mentioning.

• The needs of a corporate body are similar to the needs of the individual, or the insurance needs of a big organization are the same as a small organization. They are totally different, and each case must be looked at individually.

• Insurance is the cheapest method of handling risk. There are other potentially more cost-effective avenues which should always be explored first before turning to the commercial insurance market.

• The cost of risk is simply the insurance premium outlay. There are many hidden costs besides the insurance premium.

• The insurance policy will provide a complete indemnity in the event of loss. There are in fact many costs that are incurred in the event of loss which an insurance policy cannot cover.

• Virtually all risks are insurable. Although film stars may be able to insure various parts of their anatomy, that doesn’t mean that every risk is insurable. This is particularly true at the present time with hardening insurance markets—insurers are taking on fewer risks at higher cost.

As mentioned above, the insurance premium is not the total cost of risk. 'Total cost of risk' is a catch phrase that refers to the package of insurance measures, including the insurance premium; self-insurance through captives, mutuals, etc.; non-insurance—those elements that aren’t insured, either deliberately or due to oversight; risk control measures, which can include maintaining security staff, workplace safety programs, installing sprinkler systems, etc.; and administration, or the cost of running the insurance department. Another way of determining total cost of risk is to look at recoverable and non-recoverable costs. Recoverable costs include the cost of preparing an insurance claim and direct damage (physical damage). The list of non-recoverable costs is longer: management time, lost business/lost revenue, government intervention (in the form of increased regulation, penalties, etc.), lowered staff morale, labor unrest, damaged reputation, and lost markets.

There are a number of pitfalls in choosing an insurance program which an insurance broker could help the buyer avoid:
• **Selection of perils to be insured.** Here Murphy’s Law always applies—the risk exposure that you don’t think of, and therefore don’t insure, is often the one that causes the loss.

• **Duplication or gaps between policies.** This often occurs when there is a series of policies.

• Without looking at the total package of insurance, there could be *dilution of purchasing power*. There may be discounts given when several different types of policies are bought from one insurer.

• **No direct credit given for investment income on premiums.** For liability insurers there is an average delay of 18 months in negotiating employers’ liability claims. During this time the insurance company is earning interest on the premium.

• **Unless the proper approach is made to an insurer, the insurer will not provide adequate discounts for deductibles.** Every project should have an element of self-insurance in its program, and for that element of self-insurance there should be a discount in the premium. In other words, the higher the deductible the project management is willing to accept, the lower the insurance premium should be. However, in selecting the deductible, the project management should make sure that the discount is fractionally more than the estimated total of excesses that they would have to pay.

Risk management refers to a comprehensive, dynamic strategy for the systematic identification, evaluation, treatment, and administration of fortuitous risks which, singly or cumulatively, threaten the well-being of a business through the erosion of the benefits derived from the assets and through the impact of liabilities incurred. Risk management measures ranging from employee training to installing fire extinguishers at strategic locations to insuring against loss of income due to business interruption can help the project to be better managed both financially and physically.

Risk assessment should form the principal part of any risk management strategy. It offers a precise inventory of every risk the project faces and the measures that have been taken to mitigate those risks, and it will therefore help the company or project obtain insurance at the most economical rates.

A risk management philosophy must be set forth as a corporate directive. To be considered effective, the risk management program must be to be able to reduce the total cost of risk as the years progress. To achieve this objective, there must be a coordinated risk management effort among the corporate insurance, finance, safety, and legal functions, either through a risk management department or a committee. This department or committee should address the following components, either on its own or with the aid of an insurance broker and/or risk management consultant:
• **Probabilistic risk assessment.** This involves determining the frequency and severity of risks in a project. This type of assessment is illustrated with two case studies in a later section of this report.

• **Quantification of maximum potential losses.** This involves estimating potential losses by examining past losses for the project in question, as well as other similar projects, and reviewing information gathered during site visits and evaluations.

• **Risk reduction.** This involves mitigating the potential effects of risks that cannot be totally eliminated and will be addressed in detail in a later section of this report.

• **Design of a risk financing package.** Options include use of captives; mutuals, which are, in effect, captives for like-minded bodies; Rent-a-Captives, which are really mini-captives; internal funding or self-insurance; and insurance, either by conventional or unconventional arrangements. In a well-designed, integrated risk management program, insurance should be regarded as the last line of defense after all other measures have been considered.
Key Features of the Insurance Market
and the Role of the Broker

Adrian Platt

There are a number of key features of insurers and the market they operate in. First, insurers must have an **adequate capital base**. In some of the developing countries insurers are undercapitalized because legislation is not strong enough and there are no minimum capital requirements. We feel that new companies probably need to start with a capital base of something like $40 million+ to have a reasonable chance of success in today's insurance market. An insurer has several key financial ratios examined by the supervisory body; one important ratio, for example, is that of the company's net premium income to its capital base. A ratio of no more than 3 to 1 is generally regarded in the insurance industry as a reasonable pointer to a company's stability.

**Sound legislation** is critical. There are many parts of the world that have strong legislation and established regulatory bodies, most notably the U.S. and England. However, this is often not the case in many developing countries, including those in Eastern Europe. The classic case is the former USSR, where there isn't any insurance legislation at all. It is necessary to be aware of legislation in the project's country before using the local insurance market in any way.

That leads into **solvency ratios**, which are the key margins to demonstrate that an insurance company has adequate capital and free reserves to meet its commitments, and that it has provided sufficient reserves for incurred but not reported claims and unearned premium. Some of the solvency ratios put through by insurance commissioners are extremely complex and would be impossible to describe here. However, we recommend an analysis of the local criteria by suitable professional advisers. Legislation will sometimes provide for solvency ratios, and sometimes they will be established by the supervisory authority.

The fourth key feature is a **balanced book**. The actual book of business underwritten by an insurer can vary. Whether insurers deal in niche specialties or specific sectors, the main principle that makes an insurer succeed is its ability to balance its book. An insurer can balance its book between various classes of insurance or within the sector it writes. As with a bookmaker on a racecourse, it needs to make sure that it doesn't over commit itself on one horse.

**Adequate reserving** is the next feature. This is absolutely vital. Many insurance companies failed because they had not built up reserves for asbestosis and other unexpected environmental hazards that have been coming to light over the past decade. Our analysis has shown that there were
more insolvencies in the insurance industry because of inadequate reserving than from any other cause.

Reputation is very important with insurers. There are insurers in various countries who are capable of serving the Bank's borrowers. However, it is important to be sure that an insurer is going to give the borrower adequate service. If the insurer doesn't pay its claims, or if it doesn't service the client properly, that's to the Bank's disadvantage ultimately because it may have a detrimental effect on the borrower's ability to repay the loan.

The last key feature of the insurance market is reinsurance. The reinsurance market is the mechanism by which risks are spread. If a client wants to insure its risks (assets that it's trying to protect, liabilities that it might have to third parties, or its revenue risks), then it goes to a panel of insurers. This panel can be made up of various insurers of professional standing. It may be one insurer, it may be a group. Once panel members insure the client, they then move on and share their risk with a whole range of reinsurers. There are all sorts of reinsurers around the world; they range from underwriters in Lloyd's of London to professional organizations like the Swiss Reinsurance Corporation, the American Reinsurance Corporation, and many others. The reinsurers then reinsure themselves with what are known as retrocessionaires, who are merely reinsurers of reinsurers. This might seem like an endless game, but it is a very efficient method, in most instances, of spreading the risk.

So where do insurance brokers fit into the picture? There are several types of insurance broker ranging from local brokers who handle the personal insurance needs of individuals within their own community, to small brokers who specialize in a niche area, to the multinational brokers who have established their operations in several principal niches in many countries around the world. The Sedgwick Group, being the largest of the European-based insurance brokers, falls into the latter category. We have some 250 offices in 60 countries around the world, with roughly 13,000 employees. We specialize particularly in certain sectors in energy and industry—we have a large market share of the oil and gas business, the power and utility business, construction, aviation, marine, and others. Certainly one of our main roles is to make sure that claims are settled promptly and efficiently. Currently there are at least some 4,000 to 5,000 insurers around the world, and a broker's principal role is to help clients to sort out which insurers can most effectively cover certain risks and to determine how best to spread those risks throughout the world insurance market. By ensuring a consistent level of service, a broker can also take a burden off the shoulders of the project sponsors and financiers. But the key role for brokers is to identify, analyze, and handle risk, and in fact the Sedgwick Group plays this broader role as risk management consultants.
Risk Auditing and Risk Reduction

John Woodcock

This presentation is about two principle aspects of the risk management process: auditing risks and risk reduction or mitigation. The former entails looking at every risk exposure that a project could possibly have. The latter involves determining actions that could lessen the project's risk exposure, based on an understanding of the total cost of risk. Since all risks are measured by their financial impact on the project (or project sponsors and financiers), risk mitigation techniques must be judged by their cost-effectiveness. The result should be a project with an integrated risk management program that incorporates risk mitigation techniques, reasonable retention of risk, and insurance coverage.

The first task is to establish a risk profile. The risk profile is unique to every organization and entity; there is no standard risk profile for organizations. Risk profiling involves establishing what risk exposures the company or project has, including defining the frequency and severity of causes based on available statistics. For example, how likely is an earthquake in a project area, and how much damage could result from it? All potential risks must be considered. Threats to a business or project usually fall into one of four categories:

- **Property.** Property is not limited to what the organization owns, but also includes what it leases, rents or hires. It can be tangible or intangible—information is property, and the security and handling of information is very much a property issue. Property risks can range from radioactive contamination and magnetism to the traditional risks of fire and explosion.

- **Pecuniary.** These risks should not to be confused with the financial effects of other risks, since pecuniary refers only to those risk areas which are purely financial. Examples include loss, in a profit-making entity; loss and reduction in turnover, profit, revenue, or receivables; an increase in payables, bad debts or operating costs; and fines, damages, etc.

- **Liability.** This relates to the legal liabilities that may arise under statute, tort, or contract.

- **Personnel.** This includes the loss of services of employees or of someone on whom the entity is dependent (external services).

The risk profile measures financial risk tolerance, or the maximum financial loss that an entity can sustain before its viability is in jeopardy, and provides a basis for determining which course of risk treatment to pursue. There are many ways to handle risk, and it's a question of choosing the most cost-effective. Obviously the best treatment would eliminate the loss in the
first instance. World Bank staff have a good opportunity to eliminate risk since they routinely review new projects. But because risk elimination usually involves some major change in the approach to a project, it is usually not an option when looking at existing operations.

In order to determine the best course of treatment to reduce risks, the risks must be ranked according to importance. It is important to establish a relative ranking of frequency and severity. Absolute rankings which are based on scientifically-established frequencies or severities are not as important as relative ranking because world-wide data has not been collated and recorded sufficiently well to ensure a true scientific establishment of frequencies and severities. A helpful tool for establishing relative risk ranking is a risk ranking grid. To create five broad categories of risk ranging from minor to catastrophic, make a grid with the x axis a scale of 0-5 for severity and the y axis a scale of 0-5 for frequency (see diagram). Risks can be plotted on the grid according to these two factors, and courses of action can be determined depending on the risk category.
Risk ranking should be done twice: once at the outset to determine areas in which to concentrate risk reduction efforts, and once after all risk mitigation techniques have been applied to determine which risks to insure and how to insure them. The risk ranking grid provides an aid to decision making about risk, rather than directly influencing the level of insurance purchased. It allows the user to consider the practicality and effects of mitigating risk by physical improvements, providing financial risk treatment, or a combination of both.

The first round of risk ranking serves to identify the potential impacts of all risks associated with the investment or enterprise before risk reduction measures have been taken. It offers a base risk profile and provides a visual guide to which areas should be of greatest concern. Insurance does not yet come into the picture as a means of dealing with the risks identified—it should be the last consideration. Also, risk reduction measures instituted at this stage could help lower insurance premiums if insurance is needed.

The most cost-effective risk reduction measures vary with the different levels of risk. At the catastrophic or severe end of the risk ranking scale, the available options for risk reduction are contingency planning and crisis management. These are the final backstops that allow the entity to manage the catastrophe and lessen its impact when every physical improvement system that has been put in place fails.

At the middle layer, which covers the middle to low end of severe, all of the major risks, and the higher end of the moderate risks, lie the bulk of risks that one would look at. Here the available risk mitigation options are physical systems, training, and motivation. Physical systems involve capital works and usually have to do with the operation of the particular project. They include things like fixed fire protection, equipment guarding to protect against accidents, security fencing and systems, and equipment or systems duplication to provide backups in the event of a failure. Physical systems are introduced at this level because they will have the greatest impact.

The low end of the moderate and all of the minor risks comprise the lower-level risk exposures. Training, motivation, and practices and procedures are the first-choice options at this point because physical improvements are usually non-cost-effective. Procedures and practices are non-capital cost elements that involve time and commitment. Examples include:

- Equipment operating safety procedures, including specific training
- Safety awareness training (including videos)
- Control of external contractor practices
- Driver training programs
Training programs should be required for equipment operators and other workers who are responsible for implementing risk control procedures, as well as for their supervisors and managers.

The second round of risk ranking is required for selecting the appropriate mix of risk management techniques, ranging from self-insurance to risk control to insurance, and in the extreme, no investment. Conceptually, the areas on the risk ranking grid and their respective risk management solutions can be presented as follows:

The risk profile should be updated regularly as changes are made in project design and specifications, as well as at regular intervals after project completion. Regular updating of the risk profile is needed to allow for changes in legislation, country political climate, and environmental situations, as well as for the emergence of new risk exposures. For example, environmental risks like deforestation, acid rain, and destruction of the ozone layer have only become major concerns in the last 10 years, and they represent areas for huge potential losses due to changing legislation and litigation. It is important that the risk profile reflect this type of development.
Section III

Options for Covering Political and Other Risks
Topics Covered in Section III:

- Bilateral Investment Treaties
- Covering Political Risks
  - In the Private Insurance Market
  - Through Loan Guarantees with MIGA
  - With Insurance or Loan Guarantees from OPIC
- Official Supplier Credits
- Suggestions for Insuring Bank Projects
- Insurance for Newly-Privatized Enterprises
- Property Restitution and Title Insurance
- Crop Insurance
The Role of Bilateral Investment Treaties in Mitigating Political Risk

Peter Chase

Bilateral Investment Treaties establish international obligations that are designed to mitigate political risk. Specifically, the role of Bilateral Investment Treaties is to create a legal regime between the governments of the investor country and the host country. The basic provisions of the model BITs used by OECD countries include:

- **National treatment.** This is the obligation that the host government will treat investors from the treaty country no less favorably than a local investor in the same circumstances. The U.S. model BIT goes beyond those of many other countries by requiring national treatment for establishing operations ("the right of establishment") as well as for subsequent operations.

- **Most Favored Nation status.** Where there are exceptions to national treatment (in banking, for example), MFN status is another relative standard, ensuring that the host government will not treat investors from the treaty country any worse than investors from other countries.

- **Other treatment issues.** The U.S. model BIT also provides that investors will be able to hire the management that they need to run their investments, and that they won't be subject to performance requirements that could make them unprofitable or at least decrease profitability.

- **Expropriation.** OECD BITs establish international law standards for expropriation. An investment may be expropriated only for a public purpose, on a non-discriminatory basis, and with prompt, adequate and effective compensation. Adequate compensation entails payment of the fair market value of the expropriated investment to the investor.

- **Transfers.** BITs also permit investors to transfer funds related to the investment into and out of the host country.

- **International arbitration.** Most modern BITs provide a clause for the investor to take a dispute concerning violations of treaty rights with the host government to an international arbitration panel. The World Bank's International Center for the Settlement of

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1In this section, the OECD country entering into a BIT is referred to as the “treaty country.”
Investment Disputes (ICSID), is the preferred forum for the settlement of such disputes.

- **Consent to arbitration.** ICSID will generally only arbitrate a dispute if both parties agree to arbitration in writing. In most BITs, the treaty itself provides the host government's consent in writing that any investment dispute will be heard and arbitrable in front of ICSID at the choice of the investor. This ensures that the investor will be able to enforce treaty rights, while generally keeping the government of the treaty country out of investment disputes.

The Bilateral Investment Treaty attempts to act as a deterrent to governments taking actions that create political risk. It is a useful tool in project risk assessment, and it is a good indicator of potential political risk because it shows the willingness of a government to enter into treaty obligations and to go to international arbitration for disputes.
Insuring Against Political Risk in the Private Insurance Market

Michael Rutherford

The private insurance market for political risk is really the Lloyd's Marine market. Lloyd's has been underwriting expropriation insurance for a great many years, and the bulk of the global underwriting capacity lies with them. In addition to Lloyd's, there is a very active company market. The AIG in the United States, in particular, has been specializing in expropriation insurance for over 10 years, but they rely heavily on Lloyd's for reinsurance. And when Lloyd's capacity contracts, as it is doing at the moment, it greatly affects the capacity of the global market.

Although the base product, expropriation insurance, is written by a large number of underwriters, the coverage is largely standardized. There is basic cover for straight nationalization without compensation, but this kind of nationalization is not very common these days. "Creeping" expropriation, or actions by government which restrict the operations of the front enterprise and serve to cause the total cessation of its activities, is far more prevalent. Over the last 18 months the private market has extended its cover to include abrogation of joint venture agreements. This is mainly in response to the increase in joint ventures between private foreign investors and local enterprises, particularly in Eastern Europe.

The major insurance companies signed an agreement many years ago stating that they would not cover war risk. They thought that was a risk for governments to take themselves. As a result, the private market can cover terrorist activity, but it cannot cover physical damage due to war. There has been a huge amount of opposition to this; many insurance brokers believe that it would be very profitable for the private market to cover war risks. As a result, there was a major change in this policy about 12 months ago, and cover is now available for war damage to contractors' plants and equipment.

At the moment it is possible to obtain cover of up to about $250 million for an expropriation policy through a syndication process. In October 1991 Sedgwick placed a $250 million policy for Papua New Guinea that involved all the underwriters—some eighty-five—in this class of business. The capacity two years ago was probably $400 million, and this reduction reflects the current closing down or merging of syndicates in the Lloyd's Marine market.

One of the major drawbacks of privately insuring a project is the short cover period. The maximum available policy period for expropriation is three years, which corresponds to Lloyd's three-year accounting process. The way to get around this restriction is to roll forward the cover every year for another three years. This is not an unconditional obligation on the part of underwriters; they will only say that it is their intention to do that. In the
Papua New Guinea case, the policy was initially placed three years ago, and Sedgwick has been canceling it and rolling it forward for three years on each anniversary. This year it was only possible to place 90 percent of it. The 10 percent lost capacity might be recoverable next year, but if it is not, one option is to delay rolling it forward another year in the hope that Lloyd’s becomes buoyant again. There is certainly a risk inherent in this short policy period.

The private market also covers currency inconvertibility, but it is offered by different underwriters from those offering the expropriation insurance. It tends to be very expensive, and the market capacity is much lower than it is for expropriation. The capacity for inconvertibility has dropped down to perhaps as low as $25 million for any one contract. That’s written in the trade credit area, and the specialist underwriters there are looking to turn that capacity over as soon as they can. They don’t want to commit themselves to a three-year currency convertibility program when they can turn that capacity over perhaps 4 or 5 times on short-term trade credits.

The inconvertibility cover period is also more restrictive than with expropriation insurance. Theoretically, cover can be obtained for up to three years, and it can be rolled forward, but underwriters are trying to shorten the period. In reality, only a very good country would qualify for a three year policy.

As far as rating and access to the market is concerned, the private market requires much less information than OPIC and MIGA to write a policy. It only needs a very brief application form—about 2 or 3 pages, a brief note about the investment, and perhaps a balance sheet. The process can take as little as a day from the time of initial inquiry, including quotations from 2 or 3 underwriters.

There is no book of rates for private political risk insurers. The market is highly responsive to movements in supply and demand, and underwriters try to get the highest price for the risk in question. Limited underwriting capacity in some markets really does have a cost, however; for example, cover in Russia was costing up to 4% per annum for a three-year policy even before the coup attempt, and investors were willing to pay that rate. There was no logic for the increase—the risk hadn’t gotten any worse, but the capacity had increased. Obviously, the smaller the risk, the greater the flexibility in negotiating a price with underwriters. A large project will require the involvement of all the underwriters, which restricts the flexibility to obtain quotations. On a $25 million risk, however, there are probably 5 or 6 potential leading underwriters who will offer a price, and obviously an investor can exploit the competition between them.

The market is very flexible despite these restrictions. Private insurers will insure companies resident anywhere in the world, and they will cover both old and new investments. They will cover a whole portfolio of countries, and they will consider a first loss approach, where a multinational, rather than insuring every single investment against expropriation, might buy a
lump of cover, perhaps of $100 million, to cover a loss anywhere in the world on a first-loss basis. Private insurers also offer an excess of loss approach, whereby a company may decide it can handle the first $50 million of losses but wants some protection over and above that. The private market will certainly coinsure with anybody; it will work with OPIC and MIGA on policies, and if required, will also reinsure them. In most cases, the private market complements rather than competes with the official schemes.

Over the last two to three years there has been a massive reduction in the available cover for supplier credits and for buyer credits for project equipment and services. In particular, banks have become unwilling to take on country risk, and they are relying on some form of official government guarantee for their project financing (in which case they would have the benefit of full cover). However, the official schemes have in the past tended to write more for national interest than for commercial interest, and they have had to meet so many huge claims that they are reducing their cover. The U.K. Export Credit Guarantee Department (ECGD) is now focusing on short-term trade finance. Many companies in the U.K. are showing disappointment for how little support the government is offering, through ECGD, for the supply of goods on long terms of credit (or even medium terms of credit) because when equipment is pushed into the short-term market, coverage restrictions come into the picture. ECGD often requires the investor to insure his entire turnover in both the low risk and high risk markets in order to get cover, which becomes very expensive for an investor who is only concerned about sales in one particular market.

For the first time, banks are thus also looking toward the private insurance market and getting their credit committees to approve private market insurance as a way of transferring risk. As with expropriation insurance, the private market complements rather than competes with official schemes. It can insure contracts on a one-off basis, and it is not concerned with where the exporter is resident. It generally considers the same type of criteria for coverage as for expropriation insurance. The big change in the private market in the last 18 months is that banks can now buy this insurance directly, and thus provide suppliers with non-recourse financing without being affected by country exposure limits.
The Overseas Private Investment Corporation's Role in Insuring Against Political Risk

Mac Johnston

The Overseas Private Investment Corporation functions as an investment bank, an insurance company, and a source of information and assistance for people who are trying to identify and pursue investment opportunities in the developing world. The first two functions correspond to those of the IFC and MIGA. The third function, investor services, consists of advisory services, investment missions, preinvestment services, and outreach, all designed to help U.S. investors develop contacts and opportunities in developing countries and emerging democracies. The United States government backs the organization's commitments with a full faith and credit guarantee, and the corporation presently has assets of $1.8 billion to further insulate the taxpayers from the liabilities that it might incur. It is a self-sustaining operation with a board of directors that is composed predominantly of people from the private sector, and it works under the foreign policy guidance of the Department of State of the United States of America.

Because OPIC is both a lender and an insurance company, it can offer private investors an effective means of managing their risks. It takes on the associated risks for loans without the investor's guarantee. As a bank, OPIC provides limited recourse project financing by making loans to projects without requiring a parent company guarantee for debt service once the project is operational. We do, however, require a completion guarantee to ensure that the project reaches this operational stage.

Since OPIC is a self-sustaining institution, it looks for projects that are commercially viable and that have sponsors with a successful track record in overseas investments. In this respect, OPIC operates like a commercial bank. It can lend between half a million dollars and $50 million for a project. For smaller projects, OPIC will make a direct loan, whereas for larger projects OPIC tends to guarantee loans made by commercial banks. This is because direct loans are reserved by law for projects sponsored by smaller firms and because it is uneconomic to guarantee small loans. To the borrower, it really doesn't make any difference—the two approaches are just different windows of OPIC.

OPIC lends for all kinds of projects (energy, manufacturing, agribusiness, etc.) except munitions or something that would offend the public. It offers long-term financing for periods of 5 to 12 years, depending on the cash flow of the project. In 1991 OPIC provided about $300 million in project financing.

The insurance side of OPIC has been established to cover political risk. It provides insurance only to American investors (American companies that
are domiciled in the United States and that have majority beneficial ownership by United States citizens or wholly-owned offshore subsidiaries of these companies). There is no question that OPIC has a narrower scope in terms of the eligibility of the parties it supports than either MIGA or the IFC.

Political risks that OPIC insures against include:

- **Currency inconvertibility.** This is the investor's inability to get his profits out of the host country, or ultimately to liquidate his investment. It does not cover devaluation of the host country's currency; it is simply coverage for an inability to make remittances at the prevailing rate of exchange.

- **Expropriation.** This covers an awful lot of ground. Nowadays there's very little of the old style nationalization without compensation. Governments are very subtle; they have many other ways to achieve the same end. Most OPIC claims nowadays involve "creeping" expropriation—that is, effective and illegal deprivation of investment by means other than formal nationalization. For example, if an investor sets up business in a foreign country and that country revokes the investor's operating license or turns off his electricity, the business can no longer function. The investment is still owned by the investor, but the investor no longer has control over it.

- **Political violence.** This can range from terrorism and sabotage to cross-border war.

OPIC insures virtually any type of investment, including equity; parent company debt and guarantees; technical assistance; leases; and licensing arrangements. In recent years it has also increasingly been insuring bank loans. This type of insurance has come to represent by value approximately a third of OPIC's business. In many cases the insurance side of OPIC works hand in hand with the banking side of OPIC, for example by insuring a project's equity and debt investments for up to $100 million and by guaranteeing loans to the same project for up to $50 million. Last year OPIC insured total investments of about $1.7 million, of which about a third was loan principal.

OPIC works well with other similar institutions, including the IFC and MIGA—and indeed it has done some business jointly with MIGA. It also works with other national agencies and the private political risk insurance market.
The Multilateral Investment Guarantee Agency’s Role in Insuring Against Political Risk

Gerald West

The Multilateral Investment Guarantee Agency was created to promote international investment through insurance against non-commercial risks in response to a high demand for this kind of coverage. Investors believed that they faced unusual risks in developing countries. This did not necessarily mean that there actually were unusual risks—but it was perceived by many investors that there were substantial political risks. At the same time, there were huge gaps in the coverage available in both the national schemes and the private political risk insurance market for these risks. By creating MIGA within the World Bank Group as an insurance facility for such risks, it was hoped that the flow of private investment to developing countries would increase, contributing to the countries’ economic development process. MIGA’s intent is to facilitate investment by complementing the investment activities of the Bank and the IFC.

MIGA provides guarantees, which is to say insurance, for expropriation, inconvertibility or currency transfer, and war, insurrection or civil strife. It offers long-term political risk coverage, typically for 15 years (occasionally for 20 years), to eligible investors for investments in member developing countries. MIGA can insure only new investments, not existing investments. (The only exceptions to this rule are expansions, modernizations, financial restructurings, or privatizations of existing operations.) It can also consider equity loans and various kinds of long-term exposure of assets such as technical assistance, management contracts, franchising, and licensing. MIGA has a great deal of flexibility in its basic Convention to offer not only these basic coverages, but also to do things that were not originally envisaged even by the founders of MIGA. The MIGA Convention (Article 11) makes reference to the fact that coverage can be extended to certain non-commercial risks not specifically prohibited.

MIGA is concerned that the projects it assists are economically, financially, and environmentally sound, and analyses are done to ensure that is the case. MIGA also gives a great deal of time and attention to determining the specific terms of the coverage, delineating precisely what is and is not covered, and establishing the basis on which claims will be resolved. MIGA’s premium rates are based on OPIC’s scheduled premium rate system, which allows for considerable flexibility in adjusting the rate to the particular risk profile of the project and the particular kind of coverage that the investor is seeking.

2As of February 1992, 77 countries have completed membership requirements in MIGA, and about 40 other countries are in the process of joining.
In addition to investment insurance, MIGA also provides a group of advisory and promotional services to assist countries in the creation of a more responsive investment environment. There are two main mechanisms that MIGA employs to improve the investment environment in developing countries. There is a small unit within MIGA called the Policy and Advisory Services group (PAS). This group stages conferences and conducts other investment promotion efforts to raise the visibility of a particular country to the international investment community. The other mechanism is the Foreign Investment Advisory Service (FIAS), which is a joint venture between MIGA and the IFC. FIAS carries out diagnostic studies, which typically involve sending a team into a developing country to assess possible barriers to foreign investment. The team then advises the local government on possible legal, regulatory, and other policy changes, and it assists the government in implementing these changes. In a typical year, FIAS completes 17 to 19 such assignments.

MIGA is a young and growing institution. Its capital base at the present time is around $800 million in total subscribed capital; as others join this should eventually climb to close to $1 billion. In FY90 MIGA guaranteed four projects. In FY91 it guaranteed 11 projects, which involved facilitating about $922 million worth of investments. In FY92 MIGA should assist at least 14 projects; nine projects have already been guaranteed as of February 1992.

MIGA is actively involved in the reinsurance market. MIGA has reinsured OPIC on such projects as Freeport McMoran in Indonesia; OPIC covered $100 million of that investment, MIGA reinsured OPIC for another $50 million, and private insurers provided several hundred million dollars of additional political risk insurance coverage. MIGA has also reinsured EDC of Canada for two separate mining projects—one in Chile ($49 million) and one in Guyana ($49 million). In early 1992, MIGA also reinsured a private political risk insurer for a project in El Salvador for which the national insurance schemes run by many OECD countries were unable to provide adequate cover.

There are two reasons why there is more of this cooperation than competition among public and private insurers. First, there is more than enough risk to go around for everyone. No one has any great fear that a new insurer will crowd someone else out. Second, MIGA cannot effectively compete with the one day turnaround from private sector insurers or with the several weeks turnaround from national insurers. MIGA’s Operational Regulations and Convention contain provisions concerning the analyses of economic rates of return, environmental reviews, developmental impact, etc., which effectively preclude such a possibility.
Privatization Considerations

Most newly privatized businesses have not been insured at all, or they have been underinsured. Plants in Eastern European enterprises have often been insured for their book values, which isn't much, and plant managers have not the remotest idea of the replacement value. Also, loss of profits insurance does not exist in newly privatized companies because under state ownership there were no profits to speak of.

For enterprises being privatized by flotation that have few or no provisions for insurance, investors need to be aware that the prospectus may not represent the actual current financial status of the enterprise—nor will it accurately represent the projected future expenses and revenues. If the privatization of an enterprise is being handled by a Western company, that company will probably insist that an insurance factor be included in the prospectus. Investors should insist that the enterprise have some form of contingency fund available to keep the business going in the event of a loss. It is also vital that all the significant liabilities of a privatized enterprise are reflected in the prospectus. The insurance industry can, in the right circumstances, provide prospectus indemnity insurance. This provides the investors recourse against directors and officers who sign off the prospectus in the event that there are inadequacies in the prospectus. Regardless of how well the investor is insured against an inadequate prospectus, however, a risk audit that identifies and quantifies the key risks facing the business and that includes an environmental assessment should be a mandatory part of the due diligence process.

The insurance market not only can provide cover for newly privatized enterprises, but it can also assist in the privatization of enterprises and facilitate financing, as Sedgwick's did in the case of an enterprise in the U.K. It was a company that was once privately owned, had been nationalized, and was being reprivatized. The enterprise had a suit against it going back to the time it was previously in private hands. The government didn’t want to keep that liability, and the new owner, a management buyer, didn’t want to keep it either. The financiers left these two parties to sort it out, but neither could agree on who would accept the liability. We were able to design a product that protected either of those parties up to a suitable limit should that particular suit fall against the enterprise. The parties paid a premium for this protection, and neither of them had to hold the liability. That facilitated the privatization process.
Property Restitution

We see property restitution in Eastern Europe as less of a problem than is commonly perceived. The laws on property restitution have changed quite rapidly and significantly, making it less likely that land can be easily reclaimed. Those who are seeking to get property restored now have to put in a claim, and they might not be given the property back. They might be given compensation, but the compensation is not very large. Nevertheless, many investors are still not convinced that these new laws are going to stick because property restitution is a very emotional issue. There may be an opportunity for the insurance market to develop a new product in Eastern Europe for title insurance. There is already such a product in the United States, but it is not necessary in Western Europe.

Crop Insurance

The World Bank and the IFC are deeply involved in agriculture because it plays a huge part in world investment and development. It is very important that agricultural projects succeed. However, there continue to be great deterrents to the insurance industry playing a part in agricultural project protection. In the past there have been ghastly claims for standing crops going back several years. There is also a perception by insurers that there are risks from low moral standards—not always accurate, but that's the perception. In addition, most government-subsidized schemes have had very limited success or have failed. If project financiers, sponsors, and insurers could devise some minimum proprietary standards that would improve the risks in agricultural projects, then perhaps the insurance industry could provide coverage solutions. One possible solution would be to create some form of mutual insurer that incorporated good risk management standards—perhaps a sort of Crop MIGA—that would assist the Bank and the IFC in protecting their agricultural projects.
Section IV

Techniques for Filling Gaps in Market Coverage
Topics Covered in Section IV:

- How and Why Gaps in Insurance Coverage Occur
  - Business Decisions
  - Insurance Market Conditions
  - Legislation
  - International Business Dealings
- Remedies for Gaps in Coverage
  - Continuous Review of Risk Exposures
  - Master Insurance Policies
  - Self-Insurance
  - Premium Pooling
  - Government-Sponsored Schemes
  - Financial Products
  - Derivative Products
  - Options and Swaps
How Businesses Deal With Gaps in Insurance Markets

Terry Van Vuren

I shall address the following two questions: (i) where do gaps in insurance coverage exist in the public and private markets, and (ii) what are their solutions. I hope to provide an understanding of the gaps that exist by pointing out a few of them and their causes, and provide some insight into what solutions are available. It’s my opinion that most gaps are caused by business decisions, changes in market conditions, changes in the law, and differences between countries (customs, language, laws, and interpretations).

Because management decisions have the potential for creating an exposure that is not covered by the existing insurance program, they need to be communicated to risk managers. For example, over the last five years Lucas has been very active in acquisitions. It has acquired over 25 companies in the U.S., and each time it acquires a company, it assimilates that company’s risk into its overall insurance program. This creates the potential for gaps to occur. Lucas may be assuming a risk or risks that are not covered under its current policies.

Typically manufacturing companies like Lucas will purchase general insurance policies, such as automobile liability, worker’s compensation, general liability insurance, and property insurance—general policies that will cover many exposures. Once Lucas purchased a major aircraft refurbishing company. An aircraft would land at the airport and taxi over to the facility, where Lucas would take possession of it. Workers would pull it into one of the refurbishing company’s three hangers, do the refurbishing, take it back out and hand it back over to the owner. The risk management team found during our due diligence that at any time Lucas had over $100 million of aircraft in these three hangers that it was responsible for. However, the insurance program did not cover Lucas against damage to these aircraft while they were in its hangers—that is, there was a gap in coverage. We immediately went out into the insurance market and purchased hanger keeper liability insurance, which is insurance to pay for damage to aircraft that are in Lucas’ care, custody and control. We also changed the contract between Lucas and the owner of the aircraft such that the contract held Lucas responsible only for liability arising out of Lucas’ negligence, and no other liability. For instance, if an earthquake occurred in Santa Barbara, where this facility was located, Lucas was not responsible for damage caused by the earthquake—or any other natural disaster. The owner of the aircraft (or the owner’s insurance company) was responsible for covering that exposure.

Changes in the insurance market also cause gaps. Prior to 1985, the insurance market was what we call soft—insurers offered high coverage limits, low damage deductibles, coverage for a broad range of events, and low
premiums. As a result, the insurance companies' risk of loss became greater as they assumed more exposure to loss. Around 1985 most began losing money, and some went bankrupt. This point was generally considered to be a devastating time for the insurance industry. Because of these major losses and bankruptcies, the market began to harden. The insurance companies that didn't go bankrupt looked for ways to protect their assets. They lowered limits, they increased deductibles, they reduced coverage, and they raised premiums. They also stopped insuring risky corporations or sectors. Clients of the bankrupt companies had to scramble to get coverage from other insurers. Often comparable levels of coverage were not available. Many corporations were forced to look to state insurance programs, excess carriers, and reinsurers for reimbursement of claims owed by bankrupt insurers. Of the companies that could not find coverage for their risks in the commercial market, some went without insurance, many created their own insurance companies ("captives"), many created funding mechanisms to cover possible losses, and some, such as municipalities, schools, governments, and associations, joined with others who had similar risks to create pooling arrangements ("mutuals").

Changes in environmental legislation started occurring at about the same time the insurance market was in turmoil. U.S. government legislation made industrial enterprises responsible for environmental damage due to toxic materials dumping and other hazardous practices that were standard (and legal) in the 1970s. Just as enterprises were needing funds to clean up these dumps, insurance companies were backing away from this market segment. They established an absolute exclusion for loss caused by pollution or asbestos. Policies made prior to 1985 had language in them that the courts have interpreted as providing coverage for asbestos and other environmental claims, so we have been looking under Lucas' old policies for funding to cover these losses. If we don't find it there, Lucas assumes its own environmental risks and covers them out of current profits. Companies like Mansville (the asbestos insulation manufacturer) have sought the protection of bankruptcy courts while they seek alternative sources of funding to cover claims against them.

Foreign operations create many risks that are vastly different from domestic risks and that require special attention. First of all, language barriers can be a problem—even if you're dealing in the same language. For example, public school in England is the same as private school in the U.S., and private school in England is the same as public school in the U.S. Such simple differences in usage can have a big impact on business, so the interpretation of all legal documents, including insurance policies, must be made very clear. Another potential problem is that most foreign countries require that insurance be purchased from a local insurance company. Many of these insurance companies provide different coverage from what we're used to in the United States. They may provide less coverage, lower limits, and different deductibles, and the policies will probably be written in foreign languages. They also rarely make clear how disputes over the policy will be settled. To bring Lucas' coverage level up, we purchase a broad form master policy in the U.S. which covers as many of Lucas' exposures as possible. This
policy is designed to offer coverage where the host country policy leaves off. There is no duplication of coverage; the master policy merely fills in the gaps in the host country policy and extends that policy's coverage. We have found that having a broker in the U.S. who understands the master program is very important. This broker can communicate the details of the program to all its affiliated companies, and they can then obtain the best local coverage available. The broker will also be able to spot any uncovered gaps between the master program and the host country policy.

While there are various remedies for most of the gaps in available private insurance coverage, there are gaps for which we don't yet have solutions. Communication among corporate management, risk managers and the insurance industry is the key to identifying gaps in coverage and finding creative solutions to reduce or insure against risk exposure.
How Alternative Risk Management Techniques Can Be Used to Fill Gaps in the Insurance Markets

Clive Stoddart

There will always be gaps in the degree of protection and extent of coverage available from commercial insurers. This should, at the very least, give insurers some chance of making money from what would otherwise be an unprofitable business. These gaps can be minimized, however, or can be made to disappear altogether by ways which do not necessarily involve the commercial insurance market. I’d like to examine some examples of how alternative risk management techniques can be used to fill gaps in the private and public insurance markets.

The degree of insurance cover available from the commercial market will obviously vary from risk to risk. Typically, cover will extend to damage to property caused by a chance event (fire, earthquake, flood, theft, etc.). Cover might also be extended to financial loss arising from a chance event—for example, loss of income—as well as to political risks. The limit to cover tends to be set at a point at which either the chances of loss are so great that no insurance company could hope to make money by assuming the risks, or at a point where the risk itself ceases to be accidental, but rather becomes a commercial or trading risk, and covering it would be what we call financial guaranteeing.

There had been ample supply in the recent “soft” world insurance markets. Commercial risks had been covered many times over by a number of insurers in the worldwide markets. Their willingness to provide cover was largely governed by their own insurance protection—reinsurance. Market circumstances have changed, however, and the results of losses paid by insurers have now reached reinsurers, who are beginning to be hurt. As a result, the price of the insurers’ own protection has increased to the extent that they cannot afford to give extensive cover.

To prevent serious market fluctuations, underwriters may have to adopt a more analytical approach to underwriting. This is likely to mean that cover will be restricted and coverage prices will be more closely related to the type of risk being covered and the likelihood of loss, rather than to supply and demand. This will also mean that insurance buyers will have to look for alternative sources of funding to replace products that are being eliminated in the commercial markets.

In this market situation, risk management options outside the commercial markets are important. They include:

- Captives. If a company with better-than-average loss experience wishes to gain long-term control over its insurance programs—cost,
coverage, cash flow, claims, and investments—a captive insurance company can be one of the most efficient solutions. A captive is an insurance company set up by an industrial or commercial concern for the purpose of insuring all or part of the risk exposure of the parent group. Or, it could be a closely held (affiliated, but not necessarily wholly owned) insurance company whose business is primarily supplied by and controlled by its owners, and of which the company insuring assets is the beneficial owner. This is one way of providing insurance cover otherwise unavailable from the conventional insurance market.

- **Mutuals.** A mutual is a fund into which two or more companies pay premiums and which is used to cover losses to the companies. Mutuals can provide cover where the commercial market cannot, or at a cost that is less than in the commercial market. Evidence of the growth in mutuals can be seen in the oil industry, where during times of restricted capacity, assets have been insured by premium pooling arrangements.

- **Government-Sponsored Insurance Schemes.** Governments can play an important funding role in connection with commercially uninsurable risk, particularly environmental liabilities. Environmental liabilities were previously covered by insurers, but the magnitude of the potential losses and the long periods of risk exposure have made this cover unavailable except on the most restricted terms. The best and most cost-effective solution to this coverage shortage may be for companies to pressure their governments to develop a fund for environmental losses. This money could be used to fund clean-up and retrofitting efforts.

- **Financial Products.** The concept of using such financial (banking) tools as derivative instruments, loans, and lines of credit for risk management is not new—banks have been in the risk business for many years. But the use of financial instruments to enhance traditional insurance is different. Financial insurance and reinsurance as a class of business has a unique quality in that the policy conditions may be written almost at will—a number of areas of cover might be available that are not available from the commercial insurance market. Financial insurance and reinsurance can be offered by both banks and insurance companies. It is similar to having a credit facility that a borrower can draw down as required and repay over a period of years, except that financial policies have the benefit of transferring liabilities from the balance sheet, whereas credit facilities will continue to be shown. This feature is currently being eroded by new accounting laws that are making it a requirement to declare any financial insurance and reinsurance. Another advantage that financial policies have over credit facilities is that policy premiums may be tax deductible.
• **Options and Swaps.** This is a product that has been available for a long time, but which has never been directly linked to insurance. Some time ago, Sedgwick and Banker’s Trust combined to interpret risk management in its widest context. Within the confines of the Securities and Futures Authority, their joint venture has led to a consideration of the following types of risk management: currency options, commodity options, financial reinsurance, and swaps. An option is similar to an insurance policy in that it is received in return for the payment of premium. It provides an option to benefit from a certain price of a commodity at a certain time. It provides an insurance against either a falling or rising price—say oil or currency exchange—over a set period. For example, a British company can insure against fluctuations in the sterling price of oil by using a combined currency–commodity option. Being able to insure against such fluctuations provides stability for balance sheets. Another example would be an oil company that is developing a marginal offshore oil field. Fluctuations in the price of oil could affect the economic viability of the project. Purchasing insurance against a fall in the price of oil would guarantee the viability of the project. Likewise, the consumer of oil is totally dependent on price stability. Insurance in the form of an option, with the right strike price, would have provided much-needed comfort for commercial airlines hurt by oil price increases during the Gulf War.

In summary, the commercial market need not be the only supplier of insurance cover. While cover from traditional commercial markets is becoming scarce, new products are becoming available from other sources. The role of the banking industry within the financial services sector should increase as the insurance industry becomes more mature, responsible, and profit oriented.
Where Commercial Banks Have a Competitive Advantage in Handling Risk and Filling Gaps in Insurance Coverage

Christoph Schmidt

We at Bankers Trust have made a concerted effort in the last 10 years to shift our business from making loans to selling loans. The distinction is that we would prefer to be the arranger of capital transactions rather than the provider because it is more profitable for us. We are still involved in project finance but look to participate in new ways other than being solely a provider of capital. We do not fear credit risk; we are happy to lend, but we want our credit exposure to be priced by the markets, not just by credit analysis specialists. Bonds, for example, have credit risk and market risk. Holding a bond position, rather than the bond itself, is preferable because the credit appraisal is done on it every day by the market.

We use consultants and engineers to analyze political, legal, technical, market, operating, construction, and development risks. As bankers, we focus primarily on the financial and credit risks, where we have a competitive advantage. We analyze the underlying assumptions and the strategic consistency of projects by asking a few key questions:

- Are the project managers making business decisions based on past successes?
- Are there precedents against which to analyze the project? For example, does it make sense to build a high-tech factory in a country that doesn't have the infrastructure and the educational system to support and staff it?
- Is the investment using known and proven technology, and does the technology run the risk of being outdated as soon as the project is finished?
- Is the finished product going to make money? This is crucial for such projects as bridges—if the tolls don't provide projected revenues and the sponsor goes bankrupt, the bridge cannot be sold to recoup losses.

We also do a financial analysis of the project. We especially look at the cash flow generation. This determines the terms of the project financing and the viability of the project. The sensitivity of future cash flows are of particular interest to us because we want to see whether exchange rate fluctuations and changes in interest rates and inflation levels will adversely affect the project's cash flows and therefore its viability. The last financial aspect we look at is the project and assets valuation. If the project doesn't work, and we end up with the assets, what is the value of them? Can we sell them off and recoup at least some of the losses?
Next we look at the human dimension—the commitment of the project's sponsors.

- Is the project integral to the sponsor's success?
- Do the project sponsors have the necessary expertise?
- Are the people who will develop and run it qualified and with proven success?

We also make sure that human resources are to be allocated properly—is each person working in his or her area of expertise, or are managers running pumps and systems engineers doing the accounting?

We analyze the infrastructure in the host country to ensure that there are sufficient transportation networks as well as reliable and inexpensive sources of power to support the business.

Investment bankers and foreign exchange traders work hard to find out their trading counterpart's incentives because then they can structure trades to meet them exactly. We examine employee incentive plans for consistency with corporate objectives. Incentives are important to get the right performance out of people, but they have to be structured with exceeding care so that the corporation rather than the individual benefits. For example, there is a British company that had a foreign exchange manager whose mandate was to manage the company's forex position. Instead, he managed to lose several million pounds on foreign exchange trading last year. I would conclude that the incentives for his job were not consistent with the corporate objectives for foreign exchange management, or that he had no supervision.

One type of risk reduction tool that we use in project finance is the contractual agreement. Contractual agreements can be set up with buyers, suppliers, unions, or host governments. For example, building a refinery in the Middle East makes for a less risky investment if the investors are in partnership with or connected to a host government via a supply agreement, since most of the crude oil in the Middle East was nationalized in the 1970s. Contractual agreements with the host government can guard the supply of oil, and they can provide for a route of protest if the contract is violated.

We often ask for credit guarantees as a method of transferring project financing risks. Securities, collateral, liens, or mortgages give us something of value to cover our market exposure in the event of a default.

Derivative products present another opportunity that is unique to banks to manage and reduce risk. Derivative products are any sort of hedging vehicle whose price performance responds to an underlying financial instrument or commodity. For example, a Eurodollar Deposit futures contract is a derivative product, in contrast to a Eurodollar Deposit, which is an interest rate instrument for an actual amount of cash in a bank. A
Eurodollar futures contract only represents such a deposit—its value is based on its responsiveness to deposit interest rate changes. It provides leverage or exposure to interest rates without an initial outlay of cash. The flexibility of derivative products is one of their most important advantages. A borrower in a particular market can use derivatives to convert repayment commitments from the currency of that market to the currency of his revenues. Derivatives thus allow borrowers anywhere in the world to have access to the most liquid and deepest capital markets, and even the ability to choose the most inexpensive part of the yield curve, even when borrowers are constrained by their own local capital markets. As a general rule, derivative products and their flexibility can facilitate the capital-raising process.

Derivative products can also be used to disconnect the business from financial market demands. If a project has very seasonal cash flows, and the banks want to be repaid on a monthly basis, the project can have a cash flow problem for much of the year and an investment problem for the rest of the year. Banks that provide derivative products can take money where it's available and when it's cheapest and transform the timing of repayments to most appropriately match the cash flows from the investor's business, thereby transferring this financial risk to the bank and away from the project.

Derivatives can help investors handle financial uncertainty and market volatility. Bankers Trust benefits from market volatility; indeed, that's where we make our money. We want to manage the volatility risk because we believe we have the expertise, the systems, and the international coverage of the different financial markets to profit from it. In fact, the most profitable quarter that Bankers Trust ever had was the autumn of 1987, when the American stock market crashed. If there were a crash every year, we would have outstanding results. But most businesses are harmed by volatility. They would rather not have prices move erratically because it makes capital budgeting extremely hard for them. For example, oil companies are looking at where the price of oil is going to be in order to determine the viability of their projects. Projects done ten years ago, for which oil was projected to start at $30 a barrel and go up to $55 a barrel, are definitely losing money in today's $18.45 crude price environment. We can design a derivative products package to manage that price volatility risk, and we believe we can make money in the process. We have many innovative options available to hedge risks to suit individual needs.

Another advantage of derivative products is market coverage. There are very deep markets in derivative products in foreign exchange, debt interest rates, and in most major and many minor currencies' interest rates. For the project that has commodity, interest rate, or foreign exchange dependent cash flows, we can structure a debt repayment schedule to match the underlying cash flow generation. If the investor desires a short-term security, for example, we can restructure debt commitments so capital appreciation is based on the change in the price of oil. Alternatively, the commitments can be inversely linked to the price of oil, such that if a drop in oil price causes the project cash flows to suffer, the investor is protected by a
payout from the derivative. The provider of the derivative that fixes a floor to the oil price for the investor would pick up the cash shortfall.

There are now derivatives available in such commodity markets as aluminum, gold, copper, and crude oil (WTI, TAPIS, Dubai, Brent). These crude oil markets are continuing to expand, as are those for many oil products, such as naphtha, natural gas, kerosene, jet fuel, and heating oil. Insurance markets are also open to us through the financial reinsurance business.

Cross markets for derivative products can also be exploited. For example, an investor can buy a security that is denominated in dollars, Deutsch Marks, or yen, but the coupon could be dependent upon the cross rate between Finnish Marka and Swiss Francs. Imagination is the only limit with cross markets.

Derivative products have grown tremendously relative to the physical markets. A 10-year currency swap can be accomplished in a much greater size with a derivative product than could be done in the foreign exchange forwards market without moving that market profoundly. The futures markets are promoting commodities more and more, but the term and the liquidity in those contracts is very thin. The over-the-counter market could do a five year 20 million barrel oil swap, whereas doing that on NYNEX using WTI futures contracts would have a massive impact on the market.

There certainly still exist gaps in the coverage of investment risks in developing countries. Such bank-assumed risks as certain commodity risks remain very difficult to hedge in the absence of an organized derivative market. One example is paper pulp, where right now we’re having to match the position of both buyers and sellers, rather than take on and manage one of the positions ourselves. Wheat is also an extremely difficult commodity because it has five different delivery points and several different grades. However, we are confident that the future expansion of derivative markets will offer increasing coverage.
Section V

Insurance for Major Infrastructure Projects
Topics Covered in Section V:

- Insuring Power Companies and Projects
- Major Infrastructure Construction Projects
  - Associated Physical and Financial Risks
  - Breakdown of Responsibility for Risk
  - Typical Insurance Program
  - Suggestions for Better Insurance Coverage
- Risk Assessment of a Hydroelectric and a Motorway Project
  - Risks of Delay in Construction
  - Physical and Financial Risks During Construction
  - Physical and Financial Risks During Operation
  - Commercial Risks
  - Suggestions for Risk Mitigation and Insurance
A number of comments that I would like to have made on this session will actually be addressed in the case studies, since one of the projects we're looking at is a power project.

There are several different organizational models for power companies in different countries. In some countries there is what could be called the integrated service, where generation, transmission, and distribution are all under one management. In other countries, distribution is under different management from generation and transmission. In still other countries, where competition is increasing, there is an allowance for generators to be competing directly with distribution companies for large customers, as well as encouragement for independent generators to supply the main power companies with bulk power.

The insurance industry tends to look at power companies from a slightly different perspective. Whereas power supply companies often group generation and transmission together and deal with distribution separately (mainly for operational convenience), the insurance industry groups transmission and distribution together and deals with generation separately. This is because generation carries certain risks, and transmission/distribution carries certain others. The main area for concern with generation is the breakdown risk. On the transmission/distribution side, the high catastrophe risk is weather—lightning, high wind, ice, etc. Obviously, however, if one part of the system fails, the other parts will be affected. If there are two or more independent companies rather than an integrated management system, therefore, each must take into account the risk exposure of the others when determining its own coverage.

The spread of private sector participation in the provision of infrastructure services is bringing a number of power entities into the insurance market. Where wholly government-sponsored projects were either uninsured or only covered for limited catastrophic losses (in excess of $100 million, for example), the new privately-owned organizations are not able to accept such high self-insurance levels. However, some newly-privatized companies and most privately-sponsored projects are still sufficiently large to carry an element of self-insurance. This self-insurance element can take the form of a captive insurance company or other internal funding mechanism.

Many countries have arranged their own insurance pools, known as mutuals. These are particularly helpful for nuclear power stations, since nuclear accidents are excluded from most commercial insurance policies due to the catastrophic nature of potential losses. Mutuals are also helpful for projects using new technologies or prototype equipment. Underwriters are
inherently wary of new and untested equipment and procedures. Insurance pooling arrangements and self-insurance are a way to cover these new technologies while at the same time proving their reliability to the private insurance market.
Risk and Insurance Considerations for Major Infrastructure Construction Projects

Colin Simpson

The subject that I've been asked to address is the risk and insurance considerations of major infrastructure construction projects—power projects, transportation projects, refineries, chemical plants, steel plants, and the like. I'll be concentrating primarily on loss occurring during the construction, erection, testing, or commissioning phases, which in turn leads to the need for additional finance. In my view, there are three areas that we ought to be looking at.

The first one is the reinstatement of the completed work or plant or equipment. This can include structures or equipment being constructed, manufactured, transported, or installed. The second one is the additional cost of funding the construction of the project as a result of the delay that any major incident on site causes. This could encompass things like idle time payments to contractors, variation orders that have to be given to accommodate changes in the program, inflationary effects on the cost of labor and materials, additional import taxes, etc. The third area is the effect that the disruption or delay has on the receipt of revenue required to service the debt incurred in building the project. At worst, this could include loss of sales of electricity and loss of tolls from motorists, and it might involve providing the planned service from other facilities at additional cost to the owner. If extra interest which causes the total debt commitment to increase sharply is incurred as a result, the actual income from the project might never be great enough to service the debt, and the project would become a sort of financial sink.

The two main ways to reduce risks are risk control and risk transfer (contractually or through insurance). Risk control can embrace a number of things. Its purpose is to ensure that the incident doesn't occur, or if it does, to minimize the effects. For example, vapor clouds might well form during a commissioning process, so to minimize the danger to humans and the environment, one would try to site the project in a way that the prevailing winds would take such clouds away from people and from areas that could ignite the clouds. To ensure the competence and reliability of contractors, stringent pre-qualification criteria could be established regarding the contractor's relevant experience, financial stability, etc. Tender specifications could require that fire protection devices be installed, tested, and operational before boilers are fired or steam is introduced to the turbines. It is also well worth ensuring that key spares are pre-ordered for a project before work starts, in case something is damaged in transit or on site.

The project owner can transfer much of the risk to other parties. In my view, as much risk as is commercially viable ought to be transferred to the contractors, the consulting engineers, and the suppliers. What is
commercially viable will depend on the economic climate. In the U.K., for example, contractors are currently hungry for work, and such risks as unforeseen ground conditions that have traditionally been borne by the owner are being accepted by the contractor to ensure that he gets the job.

Once one has controlled the risk or transferred as much of it as possible to other parties, then the third option is to turn to the insurance market. Again, as much of the risk as is commercially viable ought to be transferred away from the project onto the balance sheet of insurers. Currently this is not being done on a very systematic basis.

The insurance market generally responds well to risks associated with physical loss or damage. This includes the cost of physical reinstatement and such financial consequences as lost revenues. To put things in context, the insurance industry actually evolved from providing protection from physical loss or damage—the original insurance was marine insurance, covering loss of ships at sea—and it still provides the kind of cover for physical loss or damage that could sensibly be required today. There is good capacity available in the insurance market to cover most sizes of risks, and the cost is reasonable. On the other hand, insurance is of limited value for non-damage risks; while it can sometimes provide a useful protection for political risks, credit risks, non-performance risks, and strike risks, these types of coverage deserve more careful consideration by the parties insuring the project. The level of indemnity available and the restrictive terms of cover, combined with the high cost of these types of insurance, often render these products commercially non-viable.

Let's look at what risks the various parties carry in a relatively simple civil construction job. The consulting engineers, who are responsible for the design of the project, receive fees that are a relatively small percentage of the value of the project; therefore, they like to restrict their liability to the value of these fees, and sometimes less. So, whilst consulting engineers are responsible for design, the actual financial limit of responsibility that they will accept is usually fairly low. Also, generally, they try to limit their responsibility to provable professional negligence on their part, rather than for design defects. Professional negligence, however, is often difficult to substantiate.

It is often assumed that the contractors accept the whole risk of physical loss or damage to works under construction, but this is not the case. Contractors tend to accept responsibility for loss or damage that is the result of their own failures. They also will usually accept such potential environmental perils as storms, earthquakes, lightning, and flooding. The responsibility that they are prepared to accept is not total—they will normally only accept these risks until the handover of the individual part of the project that they are involved in, i.e., not until completion of the project itself. In terms of the risks of delay and cost overruns, they won't accept any of the consequential losses apart from the relatively small liquidated damage provisions.
Owners have a contingent responsibility for the consultants' and the contractors' exposures. If they are unable to recover compensation from either of these parties, for whatever reason, the risk rests with them. They also have to accept all the other project risks.

The financier's risk is very much a contingent risk. The financier is exposed to the loss of the moneys advanced and the interest thereon, but it's only really in the event of a default.

Having looked at the risks and how they are allocated, let's look at how a normal project is insured. On a relatively complicated project, there is normally more than one consultant and more than one contractor. The consultants will normally insure for their own negligence, for a limited value, which reflects the risk that they accept under contract. Since consultants' fees are typically at most 5-10 percent of the project value, this insurance provides little protection for the project if the design is defective.

Contractors insure for damage prior to handover, the repair of their own works, and such specified risks as those associated with their contractual maintenance obligations. This cover does not extend between sectional handover and project completion. There are also numerous risks that contractors are not required to cover, such as defective designs (supplied by somebody else); unforeseen ground conditions (unless previously agreed to); acts of other parties, including other contractors; the financial consequences of damage on site; etc. In the FIDIC contract conditions there is a full list of risks for which the contractor is not required to affect insurance.

Owners, who are often state-owned corporations or agencies, generally do not insure at all. If they do insure, it's on a selected perils basis, rarely more. The financiers rely on the insurance taken out by the other parties involved in the project. However, there is quite a gap between the owner's and financiers' risks, and their ability to recover from others or from the existing insurance program is limited.

There are many disadvantages to having several different insurance policies on a project. Often situations arise where, for example, contractor A damages contractor B's works, and contractor A denies causing the damage and involves its insurers. Contractor B's insurers want to pursue subrogation rights against contractor A. A dispute between insurers ensues, and the whole project is delayed. With construction delays come cost overrun risks and risk of delay in receiving revenue, which neither of the contractors is responsible for.

There will be gaps in what the different policies cover and for how long they provide cover. Again, take unforeseen ground conditions. I've been
involved in a number of cases where we’ve had clause 12 claims under the FIDIC contract conditions. I remember there was one in Sri Lanka, Victoria Dam, where a tunnel collapsed, and the contractor was able to show that the site conditions were not what he could reasonably have expected, and hence the owner had to pay. Tarbela Dam was a similar example, and currently I’ve got a situation on the Great Belt Link project in Denmark where there’s a major row going on between the owner and the contractor as to whether or not the problems that the contractor is having driving the tunnel between Zealand and Funo are really down to ground conditions or bad contracting.

There is also inadequate protection. For example, when a bridge collapses virtually all the project cost is lost. If the cause of the collapse was a design fault, the most that can be recovered from the consulting engineer’s professional indemnity policy—and this is only if negligence can be proven—is 5 to 10 percent of the project value. The loss of revenue following damage, which is often a greater risk than the cost of reinstituting the damage, is typically not insured at all. We have a case in London at the moment concerning an underwriting center that was to be built. It was all pre-let, and just before completion, the whole facility burnt down. Of the £100 million claimed, I think something like two-thirds of that related to loss of revenue, rather than the cost of reinstating the building. I really can’t understand why this area is so often left uninsured when losses can be this great.

Finally, the existing system provides no comfort for the financiers. As BOOT projects become more popular, financiers will probably be less likely to accept a program that doesn’t provide better protection than the current system. Aid agencies have accepted the existing insurance arrangements for quite a while, but when we’ve been involved in any commercial lending projects, the financiers (commercial banks) have always been very particular about the insurance cover that they want on a project. A commercial financier will not only demand that the project is robust both commercially and technically, but also that it is robust against fortuitous losses. Certainly we spend a lot of time drafting chapters on what is being done about risk for bank information memoranda.

What can be done to improve the current insurance system for major infrastructure construction projects? Our experience on such large, privately-funded projects as Eurotunnel and the Bangkok Expressway has demonstrated that owners should obtain insurance for their projects, since any risks not covered by other parties fall back on them. They might be able to hive some risks off onto the contractor(s), the consultant(s), or the financier(s), but the owner is in the best position to affect a proper insurance

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3Clause 12 provides that the Contractor is allowed to recover against the Owner for additional construction costs arising from unforeseen ground conditions that an experienced Contractor could not have anticipated given the information he has been given or should have himself established.
program. This program should protect all the interested parties. There are often other interested parties besides the consultants, the contractors, and the financiers. In the case of Eurotunnel, for example, British Rail and French Railways have been spending a lot of money laying new track and building new trains. Obviously this financial commitment is only worth making if the tunnel is actually built. These enterprises have an insurable interest in the project, and in fact in the usage agreement that they have with the Eurotunnel Company, they have certain insurance requirements that protect them. In the case of a power project, for example, a fuel supplier who has to put in infrastructure to bring natural gas to the power station will often require its interest to be insured on a project policy.

The owner's policy ought to cover loss or damage from any cause. Specifically, it ought to include loss or damage arising from defects in design, workmanship, or materials. The lack of protection afforded the owner by the consultant's policy will be partly ameliorated, certainly if the defective design causes physical loss or damage. Insurers will normally attempt to resist giving this cover, but the market is still sufficiently competitive that on all the major projects with which I've been involved recently, we have been able to get cover for defects in design, workmanship, and materials. The owner should also provide cover for the financial consequences of delay—the additional cost of constructing the project and the loss of revenue. The other important thing is that the cover has to continue until the project comes into commercial operation. There's no point in leaving parts of the project uncovered once they are completed because that leaves the owner without financial recourse if these parts are damaged between that point and project start-up.
Insuring Projects: An IFC Perspective

David Pugh

Since IFC bears the project risk of ventures financed by it, it has an interest in ensuring that projects are realistically protected by insurance. "Realistically" in this case means that cover has been purchased where it is most necessary and cost-effective. The following is a summary of insurance coverages and risk management techniques that are particularly relevant to projects financed by the World Bank and IFC and the stages at which they would apply.

I. Planning Phase

a. Bid documents should require that architects, engineers, consultants, etc. carry professional liability insurance up to a reasonable limit. Contractors should be required to present bid bonds or obtain performance bonds.

II. Construction Phase

a. Ocean marine cover should be obtained for all imports on an “All Risks” plus war and strikes basis. The wording in the policy should have a common “hidden damage” text with (b.) to avoid gaps in cover.

b. Construction all risks (CAR) cover should also be obtained, preferably by the principal, to ensure that cover is as broad as possible and to keep costs reasonable. This policy covers any gaps in coverage between contractors and includes a liability section.

c. Advance loss of profits and marine delay in start up covers follow (b.) and (a.) above. While (a.) and (b.) provide for physical damage and cost of replacement (c.) provides for the financial effects of a delay in start up due to incidents occurring prior to that date. Cover should include an indemnity period of sufficient length to provide for the time necessary to replace the item with the longest delivery lead time.

d. Force majeure cover fills in the gaps in (a.) and (b.) from a loss of revenue perspective when delays are not the result of physical damage. Delays can be caused by strikes, change in government policy, and other factors. The market is somewhat limited in terms of available capacity and this cover may be expensive.
III. Operational Phase

a. *Property insurance* should be obtained, preferably on an “all risks” basis where available. If “all risks” is not available, “named peril” (e.g. fire/explosion, storm, earthquake, riot) would be the second choice. The selection of the required named perils requires study. Machinery breakdown cover may be needed in certain cases; at times this is added to the “all risk” policy, but it is more commonly separate. Valuation should be for full replacement as new.

b. *Business interruption* should follow the physical damage cover. In many cases interruption following physical damage can be more severe than the cost of the damage; this is a factor in evaluating which perils need to be included.

c. *Liability insurance* is inexpensive in many countries and should be a standard requirement. Where necessary product liability should be included, particularly if products are exported to Europe or North America.

d. *Other covers* may be necessary to certain industries. For example, financial institutions face a significant exposure to fraud losses.

In all cases requirements are “minimum” as the project sponsors should make the final decision as to the risks they are willing to bear themselves. All statutorily required covers must be obtained; these may include auto liability, workman’s compensation, employers’ liability, etc. It is virtually impossible to have a standard format for insurance requirements as these vary by industry and by size and type of project. Country legislation must be respected or a legal waiver obtained, and local practice must be reviewed in each case (some countries customarily give little or no notice of policy cancellation, for example).
Risk Assessment for a Hydroelectric Case Study

Peter Heap
Douglas Masham
Colin Simpson
John Woodcock

We have spent so far today looking at risk management principles. In this session, we will apply some of these principles to two hypothetical cases that reflect typical infrastructural projects. Our principle objective is to show how, in practical terms, a risk assessment should be approached. We will indicate the severity and probability of potential incidents at different stages of the cases, and raise questions that will facilitate deciding how particular risks could be handled. We emphasize that the risks addressed in these case studies should be handled by the project owners and sponsors, and there is no implication that they should be generally covered by government guarantees.

The first case study involves the construction of a new dam and hydroelectric plant. The project owner is a large electricity generation and transmission company with a number of hydroelectric and thermal electric plants which account for a sizable proportion of total national capacity. The company also operates an extensive transmission system. The project consists of an underground powerhouse plant with a high dam to be built by the rolled concrete technique. The project will cost several hundred million dollars.

We would like to analyze risks in four parts: (i) risks that would cause delay in the commencement of construction, (ii) risks that would cause delay in construction and start-up, (iii) operating risks, and (iv) commercial risks.

The main risks that would affect commencement of construction are failure to obtain possession of the land, failure to move the current residents off the land, failure to address ecological concerns, and failure to place the contracts. The power company would be responsible for handling these areas.

By far the largest risk area is in construction of the project. Arguably, the cost of delaying completion of the project would be more than the cost of physical loss or damage or of putting damage right. The prime factor for successful completion of the project is the ability of the contractor to finish the contract on time. We would recommend performance guarantees from the contractor, and in particular, performance bonds. A performance bond covers issues relating to the experience of the contractor, its financial solidity, the state of its balance sheet, how much other work it has at the time, etc., and the contractor's ability to get such a bond gives some indication of its efficiency. Either the contractor or the project manager can be required to arrange the bonds.

Physical risks are very substantial at the construction stage. Based on our experience with dams, there are several areas of concern. The first is the
underground excavation, which generally lies on the critical path of the construction program. Even when the site has been extensively surveyed, our experience has been that geological surveys are only as reliable as the interpretation between the boreholes. From our involvement with Victoria Dam, the Great Belt Link, and Tarbela Dam, where nobody expected ground condition problems on the basis of thorough exploration before the work started, the contractors have claimed that the ground conditions that they met could not have been anticipated. The encouraging feature of underground excavation in this situation is that a collapse usually will occur, generating a good insurance response to the physical damage. This is one area where we would look for project insurance to cover defective design, workmanship and materials.

In terms of risk control, as the underground excavation is so important, there has got to be careful contractor selection. Contractor selection should not only be based on the lowest bid, but also on recent, successful experience with tunneling in these sorts of conditions. It is also important to review the proposed working methods. On the Great Belt Link, part of the problem appears to be that the contractor has attempted to use the tunneling machine in a way for which it was not designed. In addition to the experience of the contractor, one should also be looking for a methods statement in the tender.

Construction supervision is also important. If the project owner takes on this role, one query is whether it or its engineering consultants are sufficiently qualified to supervise detailed tunneling work.

A second area of concern is earthquake risk. Dams are usually designed with an earthquake in mind, but the design criteria typically relate to the finished dam. Concrete dams are far more vulnerable to earthquakes before completion than after.

The third area of concern, and one of the most problematical areas with dam construction, is the temporary diversion of the river needed to build a dam. The flood risk is obviously very material, particularly during the construction period. We would need to know the design criteria the contractors will be working to when they build the temporary diversion works, and how long it will take. We would also need to know the height of the coffer dam, and insurers would be interested in the flood return period of the works. Insurers usually demand as an absolute minimum a 1 in 10 year flood return period. They would be a lot more comfortable with a flood return period for this temporary diversion of about 1 in 50 years. Another issue with flood situations besides damage of works in progress has to do with just how much debris will be carried onto the site by the river, and how much clearing up will have to be done.

According to our information, the rolled concrete technique has not yet been used for high dams. There are several questions we would pose concerning this technique: At what stage does the dam become stable? What is its ability to withstand such effects as flooding in the meantime? Are there
experienced contractors available to work with this relatively new technology, and are the project engineers qualified to supervise this work?

An important consideration is that this hydroelectric facility would constitute a significant proportion of the company's generating capacity, and thus its overall ability to supply the power market. There are certain risks involved with a potential late connection of the power station to the grid network. It is vital that the grid is extended to the site to export electricity. Where the chance of physical loss or damage during installation is substantial, from landslides or access problems in difficult terrain, for example, we would advise that priority be given to grid installation and station hook up. The possibility of late connection to the grid should be examined for its effect on the power company's revenues, and therefore its ability to repay project loans.

The last main risk that would affect the construction period is that of third party liability exposure. One risk is third party injury between contractors. Insurers would certainly want to know how the contractors are going to interrelate and how they will be supervised before providing protection for the project.

Moving on to operating risks, it is of vital interest to ensure that post-construction forecast revenues are fully developed by operating the station in the intended manner because they will affect the power company's ability to repay its loans. For this reason, those risks that would seriously disable the generating capacity must be of primary concern. Fire is obviously a critical concern in such components as generator bearings, gear drives, control rooms, transformers, and cable ways. The right level of fire protection must be built in because a serious fire, particularly when generating equipment is located in a cavern, could give rise to a severe loss of facilities. A whole range of issues connected with how a particular piece of plant could be impaired, and how that impairment might impact revenues, must be dealt with. If the station were shut down, additional power might have to be brought in from other sources to meet the company's generating requirements. Clearly, if there's little spare capacity in the national power system, the revenue capability may well be reduced by such that the loan repayments could be in jeopardy. Similarly, a prolonged period of low river flows would reduce the station's energy output. We are in fact investigating the potential cover in the insurance market for a lack of rainfall for a dam in Europe. These issues must be looked at early on, before any debt is incurred, through scenario modeling to assess the probability and severity of revenue shortfalls.

Projections often have to be made regarding the long-term silting risks for this type of project. If the sedimentation rate is greater than projected, the useful life of the dam and the station decreases. The hydrological aspects of the region could also pose financial risks, especially during extended periods of low river flow. Financial modeling is required to test the company's ability to maintain debt servicing under such conditions. Furthermore, although the average river inflow to the reservoir might be sufficient to support a hydropower station, it may be to the detriment of the
construction program. The construction schedule should be reviewed to see if it is realistic in light of possible rain delays, and the power company should be fully insured against business interruption and loss of profits.

Such commercial risks as currency fluctuation problems, which would obviously affect loan repayment; errors in output forecast; insolvency of the contractors; failure to raise sufficient financing; and interest rate fluctuation also need to be investigated. These are items which banks go into in deciding on lending for projects. We would also look into these aspects because they would affect the overall risk assessment of the project.
The second case study is for a motorway concession. We will assume that it is a BOOT-type project dependent upon raising equity in the commercial market and securing loans to support the equity participation. Many of the principles applied to the hydroelectric case are valid for this case as well, and we will not repeat them. However, there are one or two areas of concern that apply specifically to a motorway project. In looking at the risks involved with this type of project, we are drawing on our experience with the Bangkok Expressway, Dartford River Crossing in the U.K., and Eurotunnel.

One thing that would need to be sorted out is the actual concession agreement. There are certain risks associated with raising money commercially that must be addressed, such as changes in legislation or government attitude toward the project. On Eurotunnel, the government agreed to refund any money spent should there be a change in government attitude that caused the project to be abandoned. Assurance of government support, as well as protections against failure to obtain planning permissions, failure to obtain rights of way, and delay in land acquisition are items that should be addressed in the concession agreement before attempting to raise commercial finance.

If the concession company is going to be earning tolls during the construction period from part of the roadway that has been preconstructed under another contract, then the company will need to insure that piece of roadway and the toll income that it will produce.

One risk associated with roadways is that of legal injunctions—often people complain that roadway construction is causing noise, dust, etc.—which can cause delay. To the extent that these complaints are inevitable, there should be some kind of provision for them in the concession agreement. Because of the possibility of non-inevitable claims for noise and dust, the working methods of the contractor should be carefully selected and the local people who are likely to be affected by the roadway should be consulted about these problems. Once relationships are established, potential grievances addressed, and a line of protest identified that will prevent local inhabitants going to the courts to get injunctions, the project will run more smoothly.

For this project, as with the hydroelectric case, we are interested in ensuring good performance from the contractors. Prequalifying, insuring, bonding, and getting the liquidated damages sums as high as possible will take some of the risk away from the project, which is what the financiers will be looking for. They are inevitably going to be risk averse.
There may be certain physical risks associated with this project. For example, if part of the route is vulnerable to seasonal flooding, there would have to be some special sort of construction to get around that risk. On most roadways, the biggest potential loss is the washing away of embankments before the drainage is installed and the hardtop is laid (the hardtop tends to protect the embankment). The length of embankment that is going to be exposed and unprotected is another important piece of information that is necessary to properly assess the risks to the project. Also, any tunneling or major bridgework could present further risk exposure.

The risk of problems with the supply of such specialized equipment as tunneling machines and toll collection equipment has got to be taken aboard. Problems can occur during equipment manufacture, transit, and installation on site. If toll equipment delivery is delayed beyond completion of the road, the concession company will lose revenues necessary to pay for the road. If road construction is interrupted because the tunneling machines are delayed or damaged, project costs will likely escalate while the date the road will start producing revenues is postponed. It's not just the material damage that is of concern, it's more importantly the consequential losses the project might suffer if the equipment isn't there on time.

One area of particular concern is the traffic flow forecasts. The concession company itself would almost certainly have to carry the risk that actual toll revenues will not be sufficient to repay the project loans; it is probably unlikely that any government would guarantee traffic flow forecasts. The concession company might be able to recover something from whoever was responsible for making the projections if they vastly overestimated traffic flow. If traffic flow has been underestimated, it will probably be to the project's advantage. In the Eurotunnel case, the project would probably have been technically bankrupt by now had the travel consultants forecasted correctly the first time. However, they underestimated the amount of cross-channel traffic to such a degree that when the tunnel cost escalated, they were able to legitimately escalate the income figures, which kept the project technically solvent as far as the financiers were concerned.

On private power projects the critical requirements are a power purchase agreement and a fuel supply agreement that dovetail back to back. They've got to be of long enough duration for the financiers to feel confident that the proposition is viable. However, this is not possible for a concession agreement on a roadway. Tolls can be predicted, but they cannot be guaranteed. With Eurotunnel, for example, there was no government guarantee that the project would earn x amount of revenue, and of course they still don't know if they're actually going to earn x amount of revenue.\(^4\)

\(^4\)The revenue risks are allocated differently for a motorway project and a power project. In the case of motorway project, sponsors and financiers are prepared to take the commercial risk because there is no possibility of collusion amongst the thousands of users of the
The Eurotunnel financiers only had a pre-arranged usage agreement with French Railways and British Rail. They have still had to take a risk regarding projected revenues. In the case of the Bangkok Expressway, the project sponsors have been given the revenue rights from part of an existing expressway, and they’re getting tolls from that during the construction phase. They are also going to get the tolls from the new expressway that they’re building. But again, there’s no revenue guarantee. They are relying on the traffic predictions, with no government guarantee.

There is also a political element attached to the traffic forecasting difficulties. If the motorway leads to an international border, the project’s cash flow could be vulnerable to border closure. Similarly, the revenues could be vulnerable to a drop in traffic volume caused by an increase in the tax on petrol. A government guarantee on this policy might be a prerequisite demanded by the project’s financiers. There obviously could be a condition in the concession agreement which controls the maximum tariff, but there doesn’t need to be. On the Bangkok Expressway some sort of formula does apply; on Eurotunnel the owners have a free hand. A project would be commercially more attractive the less it’s regulated. Since many such projects in developing countries involve substantial commercial and political risks, they will need all the advantages they can get in order to raise equity and secure loan participation from the commercial sector.

In the case of a power project, the sales are typically made to a single state-owned utility, which has the potential power to abuse its monopolistic position. Private financiers and sponsors usually do not have sufficient confidence that governments and utilities will refrain from using this power, so they seek a cast-iron revenue (sales) agreement which guarantees them a level of revenue that will cover operating costs and debt service.
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