INCORPORATING COUNTRY RISK IN THE VALUATION OF OFFSHORE PROJECTS

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Offshore projects, especially those in emerging economies, are generally viewed as more risky, and thus as contributing less to shareholder value, than otherwise comparable domestic investments. Emerging economies are typically more volatile than the economies of industrialized countries. They also present a greater array of risks that are primarily of a "downside" nature, such as currency inconvertibility, expropriation, civil unrest, and general institutional instability. Further, because such risks are relatively unfamiliar to the investing companies, the companies are likely to make costly errors in early years and to require more time to bring cash flow and rates of return to acceptable steady-state levels.

To reflect these higher risks and greater unfamiliarity, many companies include an extra premium in the discount rate they apply to offshore and, particularly, to emerging-market projects. However, the basis for these discount rate adjustments is often arbitrary. Such adjustments do not properly reflect objective information available about either the nature of these risks, or about the ability of management to manage such risks. Nor do they take into account the reality that the risks stemming from unfamiliarity fall over time as the firm progresses along the learning curve.

As a result, companies often "over discount" projected cash flows in compensating for these risks, and so unduly penalize offshore projects. More important, adjusting for country risk using arbitrary adjustments to the discount rate fails to focus management's attention on strategic and financial actions that can be taken to reduce risk—notably, actions capable of transferring some of the company's exposures to specific risks to different parties with comparative advantages in bearing those risks. Such risk-management responses range from financial hedging of currency exposures and the purchase of insurance against political risks to alternative methods of participation in emerging-economy projects such as joint ventures with local partners.

In most cases, the decision to invest cannot be separated from the participation and risk management choices, especially since the desired risk allocation in large part reflects the fact that different potential parties to the project will place different values on particular aspects of the project. Such differences in risk-bearing capacity and valuation among parties will in turn reflect differences in these parties' asset portfolios, their costs of obtaining information, their degree of control and influence over outcomes, and their vulnerability to taxes or expropriation.

As a consequence, the value of an offshore project will depend, to a much greater extent than the value of a domestic investment, on how the project is financed, who owns the various claims, and who bears the different risks associated with the project. Thus, it is not possible to separate the overall decision neatly into a strategic problem, a capital budgeting problem, a financing problem, and a risk-management problem. Companies must attempt to address each of these aspects of the overall investment evaluation process simultaneously.

This paper proceeds as follows: I begin by developing a taxonomy of risks based on comparative advantage in risk-taking, which in turn leads to a discussion of risk allocation and participation strategies for offshore projects. The next section of the paper presents general principles of risk and valuation in the context of foreign direct investment, and I conclude with some specific suggestions for estimating discount rates for such projects.

My key findings can be summarized as follows:

- Risks should be classified in terms of whether or not the company has a comparative advantage in assuming them, which in turn depends on the firm's other assets, its information advantage (or lack thereof), and its ability to manage such risks.

- Participation strategies can increasingly be tailored through project structuring and financial engineering to allocate risks in ways that exploit these comparative advantages.
- In valuing offshore projects, how managers adjust for risk (whether by raising the discount rate or reducing expected cash flows) should depend primarily on (1) whether the risks are "one-sided" or "symmetric," and (2) whether the risks are "systematic" or instead are "diversifiable" by world capital markets. With respect to valuation, I also offer the following suggestions:
- Although more volatile, investments in emerging economies typically contribute little or no more to the volatility of a company's cash flows and its shareholders' portfolios than domestic projects because of the diversification effect.
- Political and country risks of a downside nature, such as the threat of expropriation, shifts in industrial and sectoral policy, and exchange inconvertibility, can be roughly proxied by the risk of non-payment on government bonds.
- Currency risks in general do not require additional adjustments to expected dollar cash flows or discount rates. However, they may have significant effects on these expected flows relative to most-likely levels.
- Unfamiliarity with a country should not be factored into the discount rate. The effects of unfamiliarity should decrease over time, rather than increase at a compound rate as would be implied by adjusting the discount rate.

It is important to keep in mind throughout this discussion that risk is not necessarily the enemy. The least risky countries are not necessarily the most attractive ones, nor are the most risky necessarily the least attractive. Risks clearly reduce investment attractiveness, but such risks must be weighed against the underlying sources of market attractiveness such as growth potential, as well as a firm's competitive advantage in particular countries. Risky offshore investments can add value outright by creating valuable strategic options. They can also add value in a competitive context if they create barriers to entry or provide positive-NPV investments due to comparative advantages in risk bearing. Indeed, an important part of a company's competitive advantage may be represented by the risk-management methods at its disposal. Total risk management recognizes the full range of potential responses to all sources of uncertainty.

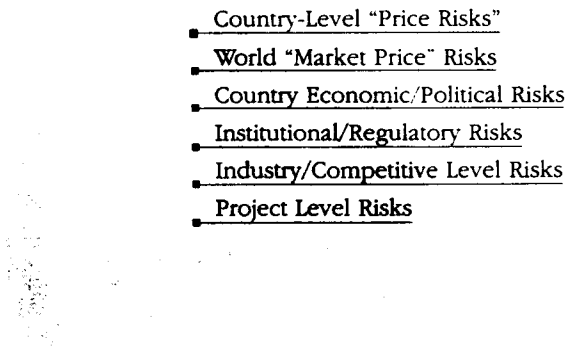
A TAXONOMY OF RISKS

Offshore investments involve a host of risks that differ from those associated with domestic projects. These include but are not limited to the classic country risks—expropriation, civil disorder, and exchange controls and other forms of payments difficulty. Companies investing offshore also face different, though not always greater, risks of macroeconomic volatility than they do at home. They also encounter currency price risks they do not face at home, since cash flows in local currency must be translated into the home currency.

Offshore investments, especially in emerging economies, also entail various risks associated with incomplete or unstable institutions. Although expropriation and war are the most visible and dramatic forms that such political risk can take, uncertainty about local governments' economic and regulatory policies may actually lead to larger reductions in the expected values of overseas projects. Finally, offshore investments, to the extent they represent new locations for the parent company, carry the risk of unfamiliarity with local institutional and operating conditions.

Figure 1 depicts, in the form of concentric circles, the various types of risk that a company faces when investing internationally. Moving from the "outer" circle toward the center, these risks are as follows: (1) world "market price" risks; (2) country macroeconomic and political risks; (3) country-level "price risks"; (4) institutional/regulatory risks; (5) industry-level risks, and (6) project/commercial risks. Most of these risks differ in degree rather than in kind from those faced at home. Indeed, the only type of risk associated exclusively with international projects are the so-called cross-border or "transfer" risks associated with commercial and financial transfers. Nevertheless, the dynamics of many of these risks are likely to be different from those faced in domestic settings. As one example, the regulatory or institutional risk of an offshore investment may differ not only because of the difference in institutions, but also because the treatment accorded a foreign company by a given set of institutions may differ from the treatment accorded a local firm (although it will not always be worse!).

FIGURE 1
RISK DRIVERS AFFECTING INTERNATIONAL PROJECTS



Comparative Advantage and Allocation of Risk

While most valuation approaches rest on the assumption of a common valuation platform in which companies value projects from the perspective of "the market" (or, equivalently, completely diversified investors), there are many reasons why different clienteles of investors—or different companies acting as agents for these different clienteles of ultimate investors—may have comparative advantages in bearing various aspects of a project's risk. Although these comparative advantages are widely recognized in the risk allocation that takes place in the context of project financing,[1] such differences in risk-bearing capacity, along with their consequences for valuation, tend to be ignored when projects are not separately financed.

Comparative advantage in risk-bearing may arise for any one of three reasons (all of which are violations of assumptions that underlie the CAPM and other standard, "equilibrium-based" valuation approaches):[2] (1) information is not equally available to all investors; (2) investors may have different degrees of influence over outcomes; and (3) investors may differ in their ability to diversify risks, largely as result of reasons (1) or (2) above.

To illustrate these three considerations, take the case of an investment by a Chilean company in an Argentine independent power generating plant.[3] The investor's advantage lies largely in the successful experience it has had in Chile with 20 years of privatization and the associated institutional innovation. In this sense, the Chilean firm can be said to "know more about the future of Argentina than the Argentines." Also, given the proximity of Argentine activities to its home base, the Chilean firm may benefit from some potential for sharing costs of specialized management, technical support, and so forth.

Table 1 shows the comparative advantage of different players in bearing different risks associated with the project. In so doing, it provides the specifications for a value-increasing shifting of risks among different potential participants. The participation of various players in the project should be structured to give those with a comparative advantage in bearing a particular risk a larger exposure to that risk, while those with a comparative disadvantage should be shielded from such risks to the extent possible. There are many different ways to do this, and the following brief discussion presents an outline of the typical approaches for each of the six major types of risk.

Operating Risk. Based on its capabilities and experience, the Chilean firm has a clear information and influence advantage in managing operating risk as compared to both Argentine firms and "first-world" firms. Indeed, this is the primary strategic rationale for the investment.

More generally, to the extent an operating firm has a comparative advantage that derives from both better information and influence over outcomes, it will want a disproportionate exposure to operating risk. The firm, for example, could increase its operating exposure beyond that implied by its equity investment through a management contract providing for bonuses for excellent performance.

Demand Risk. Demand risks are of two types: (1) those associated with the variability of overall

1. For an instructive discussion of the risk allocation that takes place in project finance, and the web of contractual arrangements it involves, see in this issue Richard Brealey, Ian Cooper, and Michel Habib, "The Use of Project Finance in Infrastructure Investments," *Journal of Applied Corporate Finance*, Vol. 9 No. 3. (Fall 1996), pp. 25-38.

2. See my earlier discussion of comparative advantage in risk bearing in my article, "Financial Risk Management for Developing Countries: A Policy Overview," *Journal of Applied Corporate Finance*, Vol. 8 No. 3. (Fall 1995). See also in this issue, René Stulz, "Rethinking Risk Management," *Journal of Applied Corporate Finance*, Vol. 9 No. 3. (Fall 1996), pp. 8-24.

3. The following example is based on public information regarding the investment of Endesa (Chile) in projects in Argentina. The example can be extended to other home/host pairs, but Chile provides an interesting setting given Chile's lead in institutional development, Argentina's greater macroeconomic and political risk, and Argentina's much larger size. Investments by, say, Thai firms in Indonesia would be quite similar.

Accounting for country risk using arbitrary adjustments of the discount rate fails to focus management's attention on strategic and financial actions that can add value by transferring specific risks to different parties with a comparative advantage in bearing those risks.

TABLE 1
COMPARATIVE ADVANTAGE IN RISK BEARING—IPP PROJECT

	Entity					
Risk Type	**Operator/ Strategic Investor**	**Local Strategic Investor**	**Local Portfolio Investor**	**Local Public Authority**	**Internat'l Portfolio Investor, Market**	**Internat'l Policy Lender**
Construction						
Delay	+	+?				
Cost	+	+?				
Operations						
Availability	++					
Staffing Cost	+	+				
Demand						
Overall				+	+	
Dispatch		+		+		+
Institutional						
Regulation	+	+	+			
Contract Enforcmt.	+	+	+			
Currency						
Inflation					+	
Exchange Rate					+	
Country						
Macropolitical					+	+
Macrofinancial					+	+
World Market						
Oil Prices					+	
Interest Rates					+	

demand and prices; and (2) those associated with the specific demand and pricing of the project's output, which depend not only on overall conditions but also on dispatching rules, pricing conditions, and so forth. Although these risks will largely be allocated by the power purchase agreement, the stability and enforceability of that agreement will in turn depend on institutional stability. A cost-indexed "take or pay" contract, for example, will impose these demand risks completely on consumers and/or distributors, whereas contingent pricing and dispatch rules will shift some or all of these risks to the project itself.

Comparative advantage in bearing these demand risks depends largely on the stability of institutional structures. If local institutions are highly stable and thus predictable, the advantage will lie with well-diversified investors ("the market"). But in countries where there is significant regulatory or institutional uncertainty, the advantage may lie with those investors with the greatest ability to influence the process.

Chilean investors may be at a double disadvantage in bearing such demand risk. First, to the extent that Argentine and other South American projects are already a very large part of their overall portfolios, Chilean investors are likely to view such a project as contributing significantly to their total risk (that is, there are no significant diversification benefits). Second, as a visible "foreign" company in a sector with a large foreign presence, such a project may be singled out for "contract renegotiation" should the existing terms prove onerous to Argentine consumers. Therefore, they may want to shift these risks to either better-diversified international players or to investor groups with greater legitimate voice within the host country such as Argentine strategic investors or, better yet, "widows and orphans" as represented by Argentine pension funds.

Institutional Risk. This form of risk involves all of the uncertainties about how the rules of the game are likely to change. Given the recent experience of public utilities in the U.S., U.K., and other presumably "stable" countries, it is clear that these risk are not limited to emerging markets. The key questions are whether the overall structure of income and decision rights will remain in place, existing agreements will be honored, and the resulting claims will be enforced. Since most of these outcomes involve at least some element of "discretion" on the part of local policymakers, risk mitigation is a key strategic lever, and comparative advantage will again lie with those most able to influence the process. As we saw in the case of demand risk, local strategic investors and pension funds may have an advantage in taking institutional risks because of their standing within or leverage over the political processes that underpin

the regulatory regime. But, because local pension funds and other passive investors are likely to be at a disadvantage in bearing operating and demand risks that require specific knowledge, they may want to limit their exposure to construction and start-up operation risks—for example, by investing in convertible bonds or preferred shares that give them an option on project equity once it is up and running.

To the extent that institutional risks are subject to mitigation by external review or pressure, it may also be in the interest of the other parties to bring international policy lenders into the project in order to mitigate these risks. The World Bank, for example, is increasingly becoming involved as a policy lender in infrastructure projects. Its participation tends to be conditional on agreements respecting institutional or regulatory behavior that, if violated, are treated as defaults on obligations to the World Bank, as well as to other lenders that have entered into cross-default clauses with the Bank.

Domestic Market Price Risks. Most prominent among such risks are those arising from changes in inflation and the exchange rate. The extent of the project's exposure to such risks will, again, depend largely on the terms and enforceability of the power purchase agreement. Because local consumers are clearly at a disadvantage in bearing such risks, the Chilean company should explore the possibility of laying off part of such exposures on derivatives markets if the appropriate hedging instruments exist. If they do not, the company may want to seek out well-diversified global investors, for whom such risks would have minimal effect on the risk of their portfolios.

Macro Political and Economic Risks. Ultimately, an IPP project in Argentina is a bet on the viability of the Argentine economic program. Although the program has now outlasted its originator, it remains subject to many stresses. All local investors, as well as Chileans who have placed big bets on Argentina, are overexposed to this risk without any significant compensatory benefits that come with having influence over outcomes.

Thus, ironically, many of the same players that have a comparative advantage in bearing operating or regulatory risk because of their knowledge and position as insiders will be at a disadvantage relative to well-diversified world investors in bearing macro country risks. In fact, it is generally the case that those most in need of country risk insurance or other mechanisms to lay off country exposure are the local strategic investors who face unusually good investment opportunities "at home" relative to other investors because of their knowledge and influence. Local pension funds and other passive investors may also benefit from such insurance because of their similar lack of international diversification.

In this particular case, as noted earlier, Chilean strategic investors are likely to be overexposed to Argentine risk as well, since they face such good opportunities there. To reduce their exposure to overall country risk while maintaining a proportionately larger exposure to operating and institutional risks, such investors can either purchase country risk insurance or enter into hedges based on derivative instruments such as puts on traded shares of local firms. Moreover, international portfolio investors can take on pure country risk by taking the other side of these hedges as well as by investing in the project equity. To the extent that overall country risks are subject to mitigation by external pressure, it may also be in the interest of the other parties to bring international policy lenders like the World Bank into the project to mitigate these risks.

Market Price Risks. The project's exposure to world price risks such as worldwide interest rates, oil prices, and exchange rates among major currencies depends, again, largely on the power purchase agreement. In the early Argentine cases, as with many Asian countries, exchange and oil price risks were assumed by the purchaser, but world interest rate risks were not. Even though many purchase agreements provide for pass-through of oil prices, a large spike in prices would create incentives for local distributors to void the contracts and switch supply. In this sense, the project remains indirectly exposed. As we have already seen, world market price risks can be laid off to financial markets by hedging with derivatives or by encouraging investment by well-diversified global investors. In the above case, for example, buying "cheap," because well out-of-the-money, call options on oil prices might prove a valuable insurance policy.

RISK AND SHAREHOLDER VALUE: GENERAL PRINCIPLES

Within a standard, risk-adusted DCF valuation approach, risk affects shareholder value in two primary ways. Two-sided or "symmetric" risks such as fluctuations in GDP, exchange rates, or interest rates—those with similar upside and downside

The risks that will contribute most to the volatility of a U.S. shareholder's wealth, or to the value of a U.S.-based firm for that matter, are those that are most closely related to the U.S. or overall world economy. In theory, it is only these "systematic" or "undiversifiable" risks that should be reflected in discount rates.

impacts on cash flows—reduce value only to the extent that they contribute to the volatility of the value of shareholders' total portfolios and thus increase their required rates of returns. The impact of an offshore investment on the volatility of investors' returns is measured by its "beta" relative to the benchmark home-market portfolio, just as with a domestic project.

In contrast, "asymmetric" risks—those whose potential downside impacts are significantly greater than their potential upside—reduce expected cash flows relative to their most-likely values as well, and thereby reduce value whether or not they contribute to the overall volatility of the firm or of shareholders' returns. Examples of downside risks are expropriation actions, casualty or war damage, or payments problems that may reduce cash flows but cannot increase them above the "usual" level. In practice, risks range along a continuum that runs between these two extremes, but clearly some are relatively two-sided while others have primarily downside impacts.

The impact of a particular risk on expected cash flows (relative to their most-likely level) also depends on the shape of the payoff profile of cash flows with respect to that risk. In the case of "debt-like" projects with limited upsides—as is often true of independent power projects given their fixed capacity—expected cash flows will be lower than the most-likely cash flows. This will be true even when the distributions of demand risk drivers are symmetric or even "skewed to the right." In contrast, the expected cash flows for "call option-like" projects with floors on cash flows will be higher than their most-likely value. Since the impacts of non-linear payoff profiles increase the volatility of the underlying risk drivers, proper estimation of the expected cash flows is particularly important for emerging-market projects.

The risks that will contribute most to the volatility of a U.S. shareholder's wealth, or to the value of a U.S.-based company for that matter, are those that are most closely related to the U.S. or overall world economy. By contrast, the risk of civil unrest in a small country due to purely local factors, while significantly reducing the expected cash flows from investing in that country, will have little impact on the volatility of a U.S. portfolio. Similarly, risks arising from unfamiliarity will clearly be downside risks that reduce expected cash flows. But, if the investment in question is relatively small, such risks will contribute little or nothing to the volatility of shareholder wealth or the firm's share price.

Projects whose value is determined by the variables that affect the U.S. economy as a whole will command high risk premiums. In such cases, the discount rates should be set substantially above the market interest rate. And, indeed, this is the way standard DCF analysis treats high-beta domestic projects whose cash flows and value respond sharply to changes in the levels of macro-economic activity.

The expected cash flows from projects facing significant downside risks will be substantially lower than those projected under normal or most-likely economic and political scenarios. Although the effect of these reductions in expected cash flows is similar to the effect of increasing the discount rate, the time profile of the two sets of adjustments is quite different. This will be particularly true of cash-flow adjustments to reflect unfamiliarity. Such adjustments will be greatest in early years, instead of rising at a compound rate over time (as would be implied by an adjustment to the discount rate applicable to all periods).

In sum, country risks of a largely downside nature such as expropriation and civil disorder reduce cash flows relative to the level anticipated under normal conditions, but will have little impact on the volatility of a well-diversified portfolio (unless they are general to a large part of the world economy, such as a collapse of the world trading system as a result of a trade "war"). By contrast, risks associated with the volatility of world macroeconomic variables will typically be quite symmetrical and therefore will not have major cash-flow impacts; and, because they will contribute to the volatility of shareholders' portfolios, they will command a risk premium. Unfamiliarity, as we have seen, will have little impact of portfolio volatility, but it will reduce expected cash flows relative to the level implied by steady-state productivity. Finally, and perhaps most counterintuitive, local variations in macroeconomic activity will have minimal effects on both cash flows and discount rates.

The Weighted Average Cost of Capital

The most common approach for valuing projects involves discounting cash flows by a weighted average discount rate that blends the cost of equity (which in turn is the interest rate plus an adjustment for market covariance risk) and the (after-tax) cost of debt:

$$NPV = \sum_{0}^{N} E(CF)_t / (1 + r)^t, \quad \text{(eq. 1)}$$

where $E(CF)_t$ is the expected after-corporate-tax free cash flow in period t and r is the weighted average discount rate. The weighted average cost of capital, r, in turn is defined as:

$$r = r_{equity} * w_{equity} + r_{debt} * w_{debt} * (1 - t_{effective}), \quad \text{(eq. 1a)}$$

where w_{equity} and w_{debt} are the weights of debt and equity, respectively, and $t_{effective}$ is the effective tax rate on debt versus equity. The cost of equity, in turn, is defined as:

$$r_{equity} = R_f + RP, \quad \text{(eq. 1b)}$$

where R_f is the default risk-free interest rate and RP is the risk premium for market covariance risk. This risk premium, in turn, is defined as:

$$RP = \text{project beta} * MRP, \quad \text{(eq. 1c)}$$

where the project beta is the measure of the covariability of the project in question with the benchmark U.S. market portfolio and MRP is the risk premium on that market portfolio.

The beta of an offshore project with respect to the investing company's benchmark portfolio can be estimated in two ways: (1) directly, by regressing returns on relevant local shares against the home-market portfolio (and making adjustments for differences in financial and operating leverage); or (2) indirectly, by estimating the beta of the project relative to the local market portfolio and multiplying the result by the *country beta*, the beta of the local market portfolio relative to the home-market portfolio. The indirect approach is an approximation that is correct only if there are no "off-diagonal" relationships between the risk exposures of the project and the benchmark home portfolio. This will, in general, be true for investments in undertakings like power generation and telecommunications that are oriented toward the local market.

Adjusting Discount Rates versus Adjusting Cash Flows

Adjustments for the risks of offshore projects relative to the typical domestic project will be reflected in several components of the general valuation formula presented earlier. Differences in project betas should be reflected as adjustments to r_{equity}, which in turn will result in changes in the weighted average cost of capital. Downside risks, in theory, should be reflected as adjustments to cash flows, although under certain circumstances (as discussed below) they may also be reflected in adjustments to the weighted average cost of capital. Differences in project leverage (or the contribution of the project to the parent's potential for leverage) should be reflected in the weighting of debt in the weighted average.

It is important to note that, in principle, the cash flows in equation 1 are *unconditional* expectations of cash flows—that is, cash flows expected under each future scenario weighted by the probability of that scenario. In practice, however, the cash flow estimates used are those that are expected under the *most-likely* set of future circumstances. This lack of clarity is not a serious problem with most projects in the relatively stable home environment. But it can create serious difficulties in evaluating offshore projects that involve substantial downside risk. The reason for this is that, with downside risks, the unconditional expectation of cash flows will be smaller than the cash flows expected under the most-likely circumstances.

Consider an investment in a nuclear power plant where there is a .10 probability of a total moratorium, with zero cash flows if the moratorium occurs. The expected cash flows from such an investment will be the expected cash flows conditional on no moratorium, multiplied by the probability of no moratorium (.9), plus the cash flows expected given that the moratorium takes place (zero), multiplied by the probability of the moratorium taking place (.1). Thus, in our simple example, expected cash flows will be .9 of the most-likely cash flows.

If the structure of downside risks is quite simple, and if their impact is expected to grow at a compound rate over time, then they can be factored into the discounted cash flow analysis either as an adjustment to cash flows (relative to the most-likely level) or as an addition to the weighted average discount rate:[4]

$$r_{adjusted} = r_{normal} + \text{adjustment for downside risks} \quad \text{(eq. 2)}$$

4. For a formal demonstration, see Levi, *International Finance*, Appendix 15.1.

A risk-adjusted discount rate formulation may be useful as a first cut for screening offshore investments. But even so, the final evaluation of specific projects should employ expected cash flows based on various scenarios, with discount-rate adjustments reflecting only market covariance risk.

Often, though, the effects of downside risks will not be so simple, and rolling them into the discount rate will be misleading. Consider the case of the downside risk resulting from unfamiliarity with a particular market. The negative impact of this risk on expected cash flows should decrease over time as the firm gains experience. In the first year of an investment, for example, productivity may be 80% of the world norm, but by year 5 it should be 90%, and by year 10 equal to the world norm. Adjusting the discount rate upward by 20% would imply a rapidly increasing downward adjustment to cash flows. Even applying an average discount rate adjustment of 10% would overstate the cash-flow impact.

Political risks associated with regulatory uncertainty are likely to display a similarly declining or, at worst, a stable pattern over time. Even payment risks are unlikely to compound upward over time, as would be implied by adjusting discount rates by a fixed factor.

Despite these caveats, a risk-adjusted discount rate formulation may be useful as a first cut for screening offshore investments. But even so, the final evaluation of specific projects should employ expected cash flows based on various scenarios, with discount-rate adjustments reflecting only market covariance risk. Even in screening applications, unfamiliarity effects should be captured in cash flows, since rolling them into discount rates is likely to involve an unacceptable degree of distortion.

Currency Risks

Currency risk presents a curious problem. On the one hand, currency movements will have a large impact on the dollar value of cash flows from foreign projects. Further, to the extent that the project involves a mixture of local and international costs or revenues, currency changes will also alter the local currency cash flows. Given that the volatility of currencies is very large, often as high as two-thirds of the volatility of equity returns, these two effects will result in significant volatility in dollar cash flows.

Despite their magnitude, though, currency risks in the sense of volatility of market exchange rates do not command significant risk premiums nor do they call for major adjustments in expected cash flows (after these are properly converted into parent currency terms). There are three reasons for this. First, currency movements, when measured in real terms (that is, adjusted for relative rates of inflation), are two-sided, with as much chance of upward as downward movements. Second, since they are the relative prices of different currencies, by definition they cannot affect all assets in the same way. Third, while fluctuations in the yen, for example, affect the U.S. dollar value of Japanese securities held by U.S. investors, the opposite is true for Japanese investors; and, assuming rough balance in investment positions across countries, we should not expect forward rates to incorporate large risk premiums.

Currency risk in the sense of a depreciating trend will be reflected in forward exchange rates that are used to convert local currency cash flows into the parent currency. This is because financial markets take into account anticipated exchange movements in determining the interest rates that underlie forward rates. In theory, forward rates should be unbiased estimates of expected future spot rates—that is, they should be fair predictors, neither too high nor too low on average. In fact, however, there is now substantial evidence that this is not exactly the case, and that forward rates themselves include small risk premiums. However, both the size and the sign of these risk premiums change over time; and, in general, such premiums are smaller than the ± 2 per cent accuracy typical of capital budgeting estimates.

By contrast, currency risk in the sense of exchange controls or other limitations on cross-border payments will reduce expected cash flows relative to their most-likely level. But this kind of currency risk is best thought of as political risk for this reason.

In summary, *currency volatility risks* contribute little to the market covariance risk of offshore investments and therefore do not require a separate risk premium. In fact, in some cases, currency movements actually offset variations in local currency cash flows and values. *Currency risk in the sense of expected depreciation* is already reflected in the forward exchange rates used to convert foreign currency cash flows. *Currency transfer or payment risk*, in contrast, does require an adjustment to cash flows relative to their most-likely level.

ESTIMATING DISCOUNT RATES FOR OFFSHORE PROJECTS

Offshore projects can be modeled either in the local or the parent currency. Some finance scholars have suggested, for example, that all cash flow modeling be done in nominal, local-currency terms and then transformed into the parent currency at

TABLE 2
ESTIMATES OF COUNTRY BETAS OF SELECTED EMERGING COUNTRIES RELATIVE TO U.S. MARKET PORTFOLIO[a]

Country	Volatility	Volatility Relative to U.S.	Correlation with U.S.	Country Beta Relative to U.S.
Argentina	61.63	6.11	0.32	1.96
Brazil	60.86	6.04	0.40	2.42
Chile	28.54	2.83	0.23	0.65
China*	40.50	4.02	0.27	1.08
India*	28.06	2.78	0.03	0.08
Indonesia	30.55	3.03	0.26	0.79
Japan, Nikkei	26.36	2.62	0.22	0.58
Korea*	25.22	2.50	-0.03	-0.08
Malaysia	25.57	2.54	0.22	0.56
Mexico	37.90	3.76	0.22	0.83
Philippines	34.16	3.39	0.22	0.75
Taiwan, China*	38.76	3.85	0.09	0.35
Thailand	31.66	3.14	0.23	0.72
Venezuala	60.93	6.04	-0.03	-0.18
U.S., S&P 500	10.08	1.00	1.00	1.00

a. Source: International Finance Corporation, Emerging Stock Markets Factbook, 1996. Correlations based on 50 months ending December, 1995 unless indicated by a *, where a shorter data server is used.

forward rates for discounting. In a 1985 paper, I proposed a similar approach, with the difference that cash flows first be projected in real terms in the most appropriate currency (which will be local currency for the revenues and operating costs of a telecommunications firm, but may be yen or US$ for capital expenditures); second, that these flows be converted to real terms in the parent currency at projected real exchange rates; and, third, that these real parent-currency flows be converted to nominal parent-currency units using projected domestic rates of inflation in order to perform the final discounting. At the level of screening projects, the differences between these two methods will not be significant. In the discussion that follows, I assume that the cash flows have been estimated conditional on the most-likely economic and political scenarios and converted into the parent currency at forward exchange rates—that is, the exchange rates projected by interest rate differentials.[5]

Country Betas and the Cost of Equity for Offshore Investments

The first step in estimating a discount rate to be applied to an offshore investment is to determine the risk premium that should be included in the cost of equity to reflect the offshore project beta. Under the simplifying assumption that the risk of the project bears the same relation to the risks of the local economy as a comparable project in the home country, the offshore project beta can be estimated as follows:

offshore project beta = beta of comparable home country project * country beta. (eq. 3)

This country beta is, in turn, the product of two underlying dimensions: (1) the volatility of the stock market (or of the macroeconomy of the country in question) relative to that of the U.S. and (2) the correlation of these changes in value with the U.S. benchmark portfolios.

Country betas relative to the U.S. market portfolio for 13 emerging countries (as well as Japan) are shown in Table 2. A coefficient of 1.0 implies that the cost of equity for a project in the country in question is equal to that for a similar project in the U.S. The coefficients obtained are considerably below 1.0 on average, showing that the market covariance risk of investments in the target countries is quite small from a U.S. perspective. In part

5. If these interest differentials diverge from projected inflation differentials, as is sometimes the case, the resulting future nominal exchange rates will imply real adjustments in the exchange rate. If this real adjustment is significant, it is important to recompute the expected cash flows taking this effect into account.

Bond risk premiums provide an objective measure of potentially serious payments difficulties that should be closely correlated with problems that a direct investor will encounter. Therefore, they provide first-cut measures of the expected impact of downside country risks.

this is due to the fact that there is little relationship between what happens in emerging economies as reflected in stock-market returns and what happens in the rest of the world.

Adjustments for Downside Country Risks

The country betas shown in Table 2 capture the effect of the market risks of the target countries, but they do not reflect the potential impacts on expected cash flows of downside risks such as expropriatory action, payments difficulties, and so forth. Ideally, the impact of these risks would be estimated by combining expert assessments of possible events/scenarios with estimates of the cash flow impacts of each of these. Various services, such as Frost and Sullivan and the Economist Intelligence Unit, publish such scenarios, providing subjective assessments of the likelihood of events such as payments disruptions. The precise impact of the scenarios of cash flows would have to be assessed on the basis of relevant operating experience and large amounts of judgment and common sense. Such analysis, while absolutely essential in evaluating a specific proposal or bid, is unrealistic at the level of screening countries.

There are at least three types of data that can be used in estimating adjustments for downside risks at the screening level:

- risk premiums on government and agency bonds issued in world currencies;
- insurance premiums charged by agencies such as OPIC to insure against specific downside risks; and
- country and political risk ratings published by organizations such as Euromoney, the Economist Intelligence Unit, and Political Risk Services.

None of these estimates is completely reliable, but they are the best generally available, objective numbers. The reasons why each is at best approximate are described below.

Bond Risk Premiums. Bond risk premiums reflect the market's assessment of potential losses due to rescheduling or outright default. The events in question do not exactly match the events that would jeopardize either the local generation or the remittance of cash flows from a direct investment. Even rescheduling is not always accompanied by limits on dividend remittances. In the case of Argentina, for example, despite repeated negotiations and nonpayment on sovereign debt through the 1980s (to the point that the secondary market price of this debt fell to 15% of its face value), dividends from businesses remained fully convertible. Further, even if there are limitations on remittances, a direct investor may be able to protect the value of cash flows through reinvestment or to find other channels for remitting the funds. Further, the direct investor can reap upside benefits in good times, whereas the bondholder can at best get the promised payment. Perhaps the best analogy is that of a preferred stock. External debt is like a straight preferred, whereas direct investment is cumulative participating preferred.

On the other hand, bad things can happen to the direct foreign investor without the event of default or rescheduling on government debt, especially in a regulated industry such as telecommunications. Delays or limits on rate adjustments in the face of inflation, for example, could substantially reduce cash flows without triggering an international crisis involving banks and official lenders.

Despite these caveats, bond risk premiums provide an objective measure of potentially serious payments difficulties that should be closely correlated with problems that a direct investor will encounter. Therefore, they provide first-cut measures of the impact of downside country risks. Listed below are sovereign bond risk premiums for a number of emerging countries provided by J.P. Morgan (August 30, 1996):

Country	Spread over U.S. Treasuries
South Africa	125
Poland	185
Philippines	226
Peru	434
Panama	514
Mexico	597
Brazil	610
Morocco	700
Argentina	718
Russia	765
Venezuela	811
Nigeria	1,087
Ecuador	1,113
Bulgaria	1,517

OPIC Insurance Premiums. Various government export credit agencies, such as OPIC in the U.S., insure against expropriation, war, and inconvertibility. The premiums charged by EFIC of Australia, for example, range from .2% of the investment per

TABLE 3
ICRG COUNTRY RISK RATINGS FOR SELECTED EMERGING COUNTRIES*

Country	Political Risk (100)	Financial Risk (50)	Economic Risk (50)	Composite Rating (100)
Algeria	50.0	36.0	28.5	57.0
Myanmar	58.0	28.0	30.5	58.0
Russian Federation	60.0	32.0	34.0	63.0
Philippines	62.0	39.0	36.0	68.5
Brazil	64.0	34.0	32.5	65.0
Mexico	65.0	41.0	31.5	69.0
India	66.0	37.0	36.5	70.0
Indonesia	67.0	40.0	37.5	72.0
China, P.R.	68.0	38.0	39.5	73.0
Thailand	75.0	44.0	41.0	80.0
Argentina	76.0	36.0	35.5	74.0
Malaysia	78.0	44.0	42.0	82.0
Chile	80.0	43.0	40.5	82.0
Korea, Republic	81.0	46.0	41.0	84.0
Taiwan	82.0	48.0	42.5	86.0
United States	83.0	48.0	38.5	85.0
Japan	86.0	48.0	44.0	89.0
Singapore	87.0	48.0	45.0	90.0

*Source: International Country Risk Guide, Political Risk Services,August 1996.

annum for "good risks" such as the U.K., U.S., and Japan to 1.2% per annum for the Philippines, Pakistan, India, Cambodia, and Vietnam. This insurance does not cover all political events; for example the denial of required rate adjustments would not be deemed an "expropriatory act," although it clearly is such from an economic perspective. Also, it covers only the book value of the investment and not expected future income stream.

Political Risk Ratings. The political risk ratings published by various services are subjective scales that bear no direct numerical correspondence to downside risks. However, they capture many dimensions of risk. Ratings for selected emerging countries, together with Japan, Singapore, and the U.S., are shown in Table 3.

In general, the country risk ratings correspond quite closely to the bond premiums in rank order. Country risk ratings, unfortunately, cannot be translated directly into cash flow or discount-rate adjustments since they are ranked on arbitrary dimensions. One way to transform them into percentage figures would be to regress bond yield spreads, which are correctly dimensioned, on various country risk ratings and then use the estimated values for each country in the analysis.

Combining Measures. Even if the country risk ratings were transformed into rates of return, simply adding the three risk measures would represent double counting, since all aim at capturing similar phenomenon. Where risk insurance is available, in principle the adjustment for covered risks should be the minimum of the expected loss and the premiums to cover such losses. However, it is then extremely hard to estimate adjustments for the uninsurable risks since all risks are rolled together into bond risk premiums and country risk ratings.

Adjustments for Unfamiliarity

As noted above, it does not make economic sense to include an adjustment for unfamiliarity in the discount rate. Instead, I suggest some standard adjustment to cash flows such as the following: Reduce operating cash flows by 10% in the first year, 8% in the second year, and so forth, declining to no reduction in fifth year. At the same time, increase capital outlays by 5% in first year declining to no increase in fifth year. An audit of actual experience in new ventures, both at home and offshore, is of course critical to assessing what these adjustments should be.

Like the risks associated with unfamiliarity, political risks arising from regulatory uncertainty are likely to display a similarly declining or, at worst, a stable pattern over time. Even payment risks are unlikely to compound upward over time as implied by adjusting discount rates by a fixed factor.

CONCLUSIONS

The free cash flows, discount rates, and the resulting present values of projects in various countries will differ because of five classes of factors:

- market and competitive factors that may be either positive or negative compared to the home-country base case;
- currency factors that may be positive (in the case of expected real appreciation) but will be generally negative relative to those of an otherwise similar home-country project;
- tax factors that may be either positive or negative compared to home-country projects;
- differences in market covariance risk that generally will be positive or neutral; and
- downside country-risk factors and unfamiliarity that will be neutral or negative.

These same sets of factors also imply competitive advantages or disadvantages for the company relative to firms based in other countries. Assuming the firm is at least equal in base skills and overhead costs to firms from these other countries, it should face significant competitive advantages in some countries, giving rise to highly profitable international diversification. There is no magic formula, of course, but it should be noted that negative aspects of countries such as monetary volatility or institutional instability are faced by all companies. Thus, the key issue is which company is best able to mitigate these risks or structure its investment to circumvent them.

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