Moody’s analysis of project financing has -- since our first project rating in 1991 – spanned the worlds of fundamental and structured analysis. No project can be assessed without an expert understanding of the industry in which it is grounded. Likewise, because a project is defined by the matrix of contracts from which it is formed, it is imperative to comprehend the documentation involved thoroughly. Such analysis has only grown more complex over the past few years as countries throughout the world – particularly those with emerging market economies – invent ever new structures in search of the key that will unlock the door to the international debt capital necessary to meet their tremendous infrastructure needs.

Notwithstanding the recent turmoil in Asia, Moody’s expects the use of project financing to continue to grow. Bonds, bank loans, CLOs, CBOs – the list of financing alternatives grows increasingly longer and yet still fails to meet the tremendous funding requirements of the world’s emerging market economies.

The demand for infrastructure by developing nations is staggering. Multilateral agencies estimate the cost of infrastructure development in sectors such as transportation, telecommunications, water, sewerage, and power at approximately US$14 trillion over the next ten years. Two-thirds of that capital is required in Asia alone. This compares with a total US$74 billion of project debt worldwide -- bank loans and bonds -- in 1997.

Those nations with the greatest demand for infrastructure capital coincidentally have a relatively greater amount of uncertainty in their political, regulatory, and economic environments than their counterparts elsewhere in the developed world. This introduces additional layers of risk to an already complicated form of financing. In addition, these areas of the world tend to lack transparency. The time taken to analyse, understand, and monitor a project over its life is

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infinitely longer in emerging markets than in countries with established traditions of information disclo-
sure. As a consequence, investors are understandably more reluctant to invest in these markets.

It is in this environment that ratings continue to prove their importance as a tool for both issuers and
investors. We believe that sustained growth in the project finance market will only occur provided all pro-
ject participants, particularly bondholders, understand the risks to which they are exposed. Moody’s will
therefore continue to ground its analysis of a project in the context of the industry to which it belongs; the
contractual matrix that defines it; and the political, legal and regulatory environment which surrounds it.

Overview

Since October 1991, Moody’s has rated long-term project finance debt of over 125 projects in 15 coun-
tries throughout the world. These projects encompass such diverse industries such as power, oil, gas, min-
ing, telecommunications, manufacturing facilities, airports, and toll roads, and include both completed
and greenfield sites.

Our experience in rating these projects indicates that no two are the same. Each project is a varied and
complex transaction with its own unique characteristics; no simple rating formulas can be unilaterally
applied. However, a number of general credit risks do apply to most projects in varying degrees. Among
the numerous risks that may be associated with project financings, some relate to the specific financing
structure; others to the nature and viability of the project itself; and still others to political, economic and
related risks in the country in which the project will operate. This special comment provides an overview
of these various risk factors, some of the ways in which project structures have sought to minimise such
risks, and how both are weighted in Moody’s ratings.

Single Asset Risk

The single asset nature of many project finance transactions is, in Moody’s view, a clear constraining fac-
tor on the ratings that can be achieved by these projects. In a single asset transaction, if revenues are dis-
rupted because of operational problems, there is no alternative source of cash flow to meet debt service
requirements. In contrast, project holding companies with diverse portfolios, and therefore more diverse
revenue streams, are much more likely to continue to meet their obligations to bondholders in the event
of a disruption at one or more of their projects. As a result, we believe that it will always be easier for pro-
ject companies to attain higher ratings based on a portfolio of diversified projects than on a single project.

For projects that do operate on a stand-alone basis, the associated risk of revenue stream disruption
can be mitigated, although not completely overcome. Projects with sound economics, in which technology
risk is low; in which there is a strong operating and maintenance contract with a reputable, experienced
counterparty; and in which adequate reserve funds are available in the event of operating difficulties are
more likely to garner higher ratings than projects without such characteristics. With such mitigants,
investment-grade ratings are achievable, but usually not high investment-grade ratings.

Economic Risk

The first step in analysing any single project or portfolio of projects is to determine whether it is “in the
money” – that is, is it likely to provide a competitive price/service which will generate sufficient cash flows
to meet all of its obligations, including the servicing of debt. Economic risk – the risk that a project will
not generate such revenues – is a function of many variables, depending on the industry of which the pro-
ject is a part and the markets that it serves. These variables can include:

• demand:
  A project may function perfectly and yet fail to generate sufficient income as a result of a lack of
demand for it or its product. This is true for projects as diverse as toll roads, power projects, or
telecommunications infrastructure.

• pricing:
  A project may function properly, attain projected demand levels, and yet fail to generate sufficient
income because the price at which its product is sold is too low. This is a particular risk for projects
producing commodities the prices of which have historically been volatile. Moody’s has rated several
projects that have exposure to commodity type risk – for example, in mining, the project debt of Murrin Murrin Holdings Pty Limited (Ba3) and the project debt of Glencore Nickel Pty Limited (Ba1); and in energy, Ras Laffan Liquefied Natural Gas Company (Baa 2) and Petrozuata Finance Inc (Baa1).

Traditionally, in power project financings, this risk has been absorbed through ‘take and pay’ contracts (as discussed below). However, as electricity markets move toward open competition, ‘merchant’ risk -- which affects both demand and price -- will become an issue for power projects. (For more information on the assessment of this risk, please refer to Moody’s forthcoming special comment on merchant power.)

• **variable costs:**

  The economics of a project may be predicated on fundamental assumptions as to certain variable costs over its life. These assumptions may, however, fail to hold, exposing the project to fluctuations in its variable costs that cannot be passed on in the form of higher prices. This can take, for example, the form of exposure to fuel costs in the case of power projects.

**COMMON MITIGANTS**

The common characteristics of projects most likely to generate cash flows sufficient to repay debtholders and provide a satisfactory return on equity include:

• **take-and-pay contracts:**

  Under these contracts, most often seen in power projects, an ‘offtaker’ agrees to purchase the electricity generated by the project at a set price for a certain period. The formula for calculating the price may allow for adjustments to take account of increases in variable costs, such as fuel.

  Such contracts seek to minimise exposure to demand and price risk, though they instead introduce exposure to the credit of the offtaker and its ongoing ability to meet its contractual payments. Further, the contract is only as good as the legal and political environment in which both parties operate. In times of economic or political stress, the contract may have little value if the offtaker cannot or will not honour its terms and the project company cannot enforce it, because of legal or political constraints.

  Because of these potential constraints, Moody’s has always believed that the reliability of such contractual obligations is a function of the economic viability of the project. The less economical it is, the less likely that it will be honoured if the offtaker can find a way out.

• **offtake agreements:**

  Such agreements provide less robust support than a take and pay contract in that the offtaker agrees to purchase a certain amount of the project’s product, but at a price determined by the relevant market. Such a contract seeks to mitigate the ‘demand’ risk outlined above, but still leaves the project exposed to price/market risk.

• **low-cost producer:**

  Projects exposed to market or commodity risk need to show that even in severe downturns in the pricing for their product, the project will remain economical. This involves a two tiered approach: (a) comparing the project’s cash cost of production to that of its existing and potential competitors; and (b) an analysis of historical price volatility for the project’s product to assess whether forecast commodity prices are reasonable. In this way, Moody’s seeks to understand how low prices could be driven in the future by competitors and by market conditions, and whether in such a climate, the project in question would still be able to make sufficient returns to cover its debt obligations and provide a return to equity participants.

• **high coverage ratios:**

  Moody’s gives credit in its ratings for high debt service coverage ratios that are based on robust, stable cash flows that are likely to withstand a variety of potential scenarios. Forecasted revenues from a project may be significantly higher than required to meet all of its obligations over its life. However, it should be recognised that forecasted debt service coverage ratios are just that: forecasts. In particular, high coverage ratios that are dependent on predicted demand or predicted market prices are necessarily less certain than coverage ratios based on take and pay contracts.
• creditworthy sponsors:

The injection of substantial amounts of equity by a creditworthy sponsor or sponsors not only provides debtholders with a cushion against downturns or unforeseen risks, but also provides strong motivation for the sponsor or sponsors to ensure the continued success of the project.

Analysing Sovereign or Sub-Sovereign Support

Often project participants will look to enhance the fundamental creditworthiness of their project by looking to sovereign or sub-sovereign entities to assume risks to which bondholders would otherwise be exposed. In other words, the project seeks to assign a risk to that sovereign or sub-sovereign entity.

Analysing the value of such support is often a difficult process. This is because the support may or may not be in the form of a legally binding agreement, may be ambiguous, and may or may not be in a country with a stable political and an effective legal environment. In a country with a stable political environment and an established and reliable legal process, it is relatively simple to give benefit for unequivocal, binding, and enforceable support (such as a guarantee) from a sovereign or sub-sovereign entity. However, absent such ideal circumstances, it is much more difficult to impute sovereign or sub-sovereign credit quality directly to the project to which it is offering support.

Increasingly, support may not be directly from the sovereign or a sub-sovereign at all. It could be from a state-owned entity of some sort. This is often the position in China, where, because of central government restrictions, provinces cannot guarantee foreign currency debt. Instead, local department or bureaus agree to contractual terms that impose particular risks on them. Such contractual arrangements are often portrayed as akin to guaranteeing payment, since they seek to neutralise the impact on the project of certain foreseeable risks. However, the fact that the enforceability of such obligations is questionable is often glossed over.

The extent to which sovereign support should be factored into a rating is, therefore, necessarily a qualitative process. Moody’s evaluation of such support will focus on many factors, including the form and substance of the support and the willingness and ability of the relevant entity offering the support. In other words, we first ascertain exactly what support is being offered. Is it the sovereign or a conduit of the sovereign? Does the relevant support party truly intend to support the project in the manner which is being represented? Is the asset strategically important? Has the sovereign or sub-sovereign a track record of honouring similar types of obligations? Is the support being offered in a legally binding manner? And finally, and most obviously, does the relevant party truly have the means to provide such support if called upon to do so?

In Moody’s view, the more viable the economic fundamentals of a project, then the more credible the support offered. Support will not be seen as a panacea for projects that are patently uneconomic or that have the potential for severe operational or other problems.

Political Risk

There is an element of political risk associated with most project financings by virtue of the fact that they are often related to capital-intense infrastructure development, in which governments obviously take a keen interest. Political risk has been, and will undoubtedly continue to be, an especially key component in the development of project finance in emerging markets, where the huge demand for infrastructure development necessitates continued access to cross-border funds.

Moody’s project ratings reflect the impact on a project of political risk at both the macro-economic and the project specific level. On the macro level, a country’s foreign currency bond rating (its “sovereign ceiling”) will generally act as a cap on the rating that can be obtained for a project located in that country. On the project specific level, Moody’s assesses elements of political risk that could affect the ability of that project specifically to repay its debt as promised.
Political risk can take a variety of forms. As well as sovereign or transfer risk, it may take the form of inadequate regulatory regimes or the potential for political interference in the regulatory process. These risks are discussed in detail below.

**REGULATORY RISK**

In Moody’s view, a strong, stable regulatory regime that is sensitive to a project’s need to adapt to changing economic conditions is vitally important to the project’s ability to continue to meet its obligations. Many projects (particularly power) directly or indirectly rely on a tariff payment of some sort to generate revenues. Increases in that tariff are, however, often controlled by central or local government. Despite assurances (contractual or otherwise) there is the risk that in times of stress there will be political reluctance to allow the tariff to be increased in the way envisioned in the project documentation.

A recent example of how an inability to raise tariffs can impact the creditworthiness of projects is the problems currently being faced by PLN, the Indonesian state owned electricity company. Under various power purchase contracts with foreign owned independent power projects (IPPs), the cost of power to PLN is dollar indexed. With the recent devaluation of the rupiah, the cost of these contracts to PLN has increased substantially. As a consequence, it has an urgent need to increase the electricity tariffs it charges to its customers. However, because of the volatile political and economic position of Indonesia it has proven impossible for PLN to increase the tariffs in any meaningful way. With no real way for PLN to meet its elevated power purchase costs, the company is under increasing pressure to renegotiate the power contracts. It was this political pressure on PLN that led Moody’s to put on review for possible downgrade two Indonesian power projects in December of last year – prior to the sovereign ceiling being downgraded. (See Moody’s upcoming report on the Indonesian Independent Power Projects for more on PLN.)

**TRANSFER RISK AND COUNTRY CEILINGS**

On a macro level, how international investors view the sovereign risk of a nation has a critical impact on their willingness to extend credit to borrowers domiciled in that country. Moody’s sovereign ratings are routinely used by major banks and investors worldwide in determining their credit exposure limits to particular nations. The country, or “sovereign”, rating is intended by Moody’s to capture the possibility that during a foreign currency crisis the nation may choose to limit all foreign currency payments by entities subject to its legal jurisdiction. A particular government could be viewed as having an Aaa level of capacity to repay debt denominated in its own currency; yet, its rating on foreign-currency debt could be lower because of the nation’s large external debt or other political or economic factors.

Moody’s particular concern with foreign currency debt parallels what economists call “transfer risk” – that is, the probability that a borrower facing the obligation to make a payment in foreign currency might not be able to convert its own domestic-currency cash flow into the required foreign exchange in a timely fashion. Such transfer risk may occur, for example, because of a liquidity crisis in the international currency markets.

The country rating acts in most cases as a cap on the ratings of the foreign-currency denominated securities of any entity that falls under the political control of a particular sovereign. Nevertheless, it is possible for project finance transactions in limited circumstances to ‘pierce’ the sovereign ceiling. (See “Moody’s Approach to Structured Finance Transactions: Piercing the Foreign-Currency Country Ceiling” and “Piercing the Sovereign Ceiling: Issues in Oil and Gas Project Financing.”) Examples of project finance transactions that have pierced the sovereign ceiling of the country in which they are domiciled include Petrozuata Finance Inc. (Venezuela) and Ras Laffan Liquefied Natural Gas Company Ltd. (Qatar).
Currency Risk

In the case of non-US projects, an absence of domestic currency capital markets has necessitated the use of US dollar financing. But at the same time, these projects can involve the sale of a product into the local market for payment in the local currency. The most common example is power projects.

This exposes a project to two separate but connected risks – transfer risk and currency devaluation risk. Transfer risk – or the risk associated with the ability to convert local currency cash flow into US dollars – we have already discussed. By currency risk, we mean here the risk that the local currency will devalue, impacting the ability of the project to meet its US dollar obligations with the devalued local currency revenues.

In assigning a rating, Moody’s will look to the mitigants a project adopts in respect of this issue. Common mechanisms we have seen include:

• dollar indexing
  Some projects, like power projects and toll roads, have adopted mechanisms that directly or indirectly allow the projects to increase their revenues when there are devaluations. Take and pay obligations in power projects, for example, are often calculated by a formula that allows increases to take account of currency fluctuations. Likewise, some toll road financings allow the project company to increase tolls to account for increased financing costs as a result of devaluations.
  However, we believe that such mechanisms can at best act only as an imperfect hedge. If the currency devaluation is extreme, then the ability or willingness of project participants to increase tariffs dramatically becomes questionable. The project becomes, in these circumstances, susceptible to political risk. This is clearly one of the lessons coming out of the Asian crisis. Nevertheless, dollar indexing has been shown to work thus far when the devaluations have been less extreme – in the Philippines for example.

• hedging contracts
  Foreign currency swaps can be used to minimise currency exposures. For example, in the recent Perth airport US$ bond issue, the issuer is under an obligation to keep a currency swap in place for the life of the US$ bonds. However, these arrangements are less common in project financing in emerging markets. The long maturities of a project’s debt and the amount of such debt requiring hedging can make the cost of a swap prohibitive, if a willing counterparty can be found at all.

• coverage ratios
  Predictable local currency revenues at significantly higher levels than that required to service the project debt at current exchange rates can provide a buffer against later devaluations.

• dollar debt service reserves
  If placed offshore, debt service reserves denominated in US dollars can provide protection against the initial shock of devaluations, giving a project breathing space. However, sizable long-term devaluations will likely wipe out such reserves fairly rapidly.

It is clear that as of yet no cost-effective and completely comprehensive mitigant against extreme currency devaluation exists. The recent troubles in Asia have shown that currency exchange rate volatility can be extreme, and can significantly affect the economic viability of a project. Mitigants adopted may protect an investor only to a certain extent. In analysing and monitoring a project, Moody’s will review devaluation risk with its sovereign analysts and assess what mechanisms a project has in place to mitigate this risk to a level commensurate with the rating assigned.
**Transaction Structure Risk**

A project may be economically sound until it is viewed in the context of the structure that finances it. Moody’s will review the project structure for:

- protections to bondholders such as: amortisation of debt as opposed to relying on refinancing; minimum coverage ratios that must be met before shareholder distributions are made; and substantial debt reserves to meet unforeseen contingencies.
- an experienced trustee to control cash flows and monitor project performance on behalf of bondholders
- limitations on the ability of the project company to take on new debt
- leverage:
  The amount of equity the project sponsor has injected acts not only as a protection for bondholders, but also as an incentive to the sponsor.
- certainty that equity contributions will be made as contracted
  Depending on the rating of the project and the rating of the equity participants, there may need to be some third party support for the obligations of the equity provider. This support could, for example, take the form of a bank letter of credit.
- force majeure:
  Project contracts will always contain provisions relieving participants of all or some of their obligations upon the occurrence of certain force majeure events. The wider the definition of these events, the less reliable becomes the contractual matrix of the project. A participant may be relieved from assuming certain risks that it is has contracted to accept because it falls under the definition of a force majeure event. It is important, therefore, that force majeure events are tightly defined and, except in the event of major catastrophe, have only limited impact on contractual obligations.

**Legal Risk**

Moody’s focuses on three key areas when assessing the legal risks of a transaction:

- **enforceability of contracts:**
  Because a project financing is largely defined by the terms of its contracts, a key issue is obviously whether the contracts are clear and comprehensive. In emerging markets, particularly Asia, important steps have been taken in recent years in reducing ambiguity and in covering all key issues under the project contracts.

  However, a continuing issue in emerging markets is the enforceability of such contracts if necessary. The legal systems of most countries in Asia remain less independent and predictable than those we are used to seeing in more developed economies. The potential for political interference in the judicial process and the simple lack of certainty of outcome in the judicial process continue to be inhibiting factors in the ratings assigned to projects in Asia and other emerging markets.

- **compliance with approvals:**
  It is important to understand whether the project complies in full with the laws and applicable regulations of the relevant country. Projects that seek to circumvent relevant laws or approval processes may at a later date find it difficult to obtain approvals to continue construction or operation because of a real or perceived regulatory issue – this may be particularly true in times of stress when a local party may be looking for an excuse not to honour some of its commitments.

- **effectiveness of regulatory regime:**
  Revenue flow increases to projects are often subject to a regulatory process. For example, increases on tolls payable on roads may require state approval. If a project seeks to mitigate some variable cost exposures by proposing to pass these costs on to end users, Moody’s examines the regulatory fetters on the project’s ability to do this. If the project requires the approval of political bodies, then clearly it is important to understand whether this approval is discretionary and, if so, what comfort the project has that such approvals will be forthcoming when requested. In many ways, this issue is closely linked to issues of legal enforceability and political risk.
Construction Risk

The potential for a greenfield project to fail to complete its construction on time, in accordance with specifications, and on budget is probably the most obvious risk to bondholders of this type of project. Moody’s will assess the ways in which a project seeks to minimise the exposure of bondholders to pre-completion risk. In doing so, Moody’s takes a number of factors into consideration including:

- **complexity of construction:**
  The more complex the construction process, the greater the risks to bondholders during that process. Some types of projects are clearly more complex to construct than others. For example, a toll road is usually a more straightforward construction than a petrochemical plant.

- **experience of contractor:**
  Moody’s will look for evidence of the ability and experience of the contractor in constructing similar projects. Evidence of consistent delivery of similar types of projects on time and on budget will be a mitigant.

- **strong turnkey contracts:**
  A fixed price, date certain, turnkey construction contract with a creditworthy contractor is a strong mitigant in respect of construction risk. A turnkey contract is a contract for the construction of a project and installation of all facilities, providing for the project to be handed over only when it is ready for immediate operation.

- **completion guarantees, liquidated damages, and reserve funds:**
  As a protection against delays and cost overruns, Moody’s will look at any completion guarantees provided, the form of liquidated damages and the size and form of reserve funds.

- **independent engineer’s report:**
  Moody’s will review this report for confirmation of the feasibility of the completion of the project on time and on budget.

- **legal approvals and permits:**
  It is important to show that a project has obtained all necessary legal approvals and permits for acquiring the site, developing the site, and importing all necessary project materials and equipment.

Operating and Technology Risk

Projects that utilise new or unproven technology run a higher risk that they will run into construction and/or operating problems that can impact on revenues available to bondholders. Moody’s will assess the type of technology being used in a project to ascertain whether this technology has a proven track record. Other important factors include the manufacturer of the technology and their track record, and the experience of the operator in using such technology.

Where technology is unproven, Moody’s will look to how this risk is addressed. Does the manufacturer, contractor, or operator provide undertakings or warranties? What other comforts are there that the technology will function as promised? Who bears the risk if it does not? What level of debt reserves are there to allow for operating disruptions?

Conclusion

Notwithstanding the recent Asian turmoil, Moody’s expects the use of project financing to continue to grow over the medium term. In particular, the requirements of emerging markets for capital for project development are simply too large for traditional debt financing to provide on its own.

However, sustained growth will only occur provided all project participants, particularly bond holders, understand the risks to which they are exposed. In this context, Moody’s will continue to work with all market participants in rating and monitoring project debt, and in providing clear expositions of the risks involved for each project we rate.
Special Comment

Key Credit Risks of Project Finance

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