Chapter 21

Structured Financing Techniques in Oil and Gas Project Finance

Future-Flow Securitizations, Prepaids, Volumetric Production Payments, and Project Finance Collateralized Debt Obligations

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I. INTRODUCTION

Project finance is the extension of credit to finance an economic unit where the future cash flows of that unit serve as collateral for the loan. By facilitating the separation of project assets from the sponsor and enabling the financing of those assets on the basis of the cash flows they are expected to generate, project finance can allow a sponsor to undertake a project with more risk than the sponsor is otherwise willing to underwrite independently. Project finance can also help sponsors avoid incurring leverage beyond tolerable levels, thereby helping them preserve their debt capacity, credit ratings, and cash flows for alternative capital investment activities.

Large-scale oil and gas projects have been popular subjects for project financing since the inception of the market. Indeed, modern project finance is thought to have begun in the 1930s when a Dallas bank extended a nonrecourse loan to finance an oil and gas project.¹ Project finance “came of age” in the 1970s and 1980s with the

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¹ Economic equivalents of project finance actually date back to the Assyrian and Mesopotamian eras. See, e.g., Edward J. Swan, Building the Global Market: A 4000 Year History of

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successful financing of North Sea oil and gas projects, Australia's northwest shelf gas project, independent nonutility power generation in the United States, and similar substantial projects. In more recent years, oil and gas projects remain second only to power projects as the basis for project financings.2

Structured financing techniques in oil-and-gas-related project finance have grown more popular over the past several decades. Securitization, in particular, has played an important role in project finance by increasing oil and gas sponsors' access to affordable financing from the capital markets and helping banks refinance their project loan exposures. As a consequence of the current credit crisis, structured project financing methods are even more important than in the past. Without the potential benefits of structured financing, oil and gas project lending in the current credit-and capital-constrained environment could contract precipitously.

In this chapter, we review several important examples of structured financing techniques used in oil and gas project finance. We begin with a brief introduction to project finance and the role of oil and gas projects in the project finance business. In Section II, we review the types of structured financing techniques often employed in project financing, as well as the benefits of utilizing these structured financing methods. The next three sections explore prominent types of oil and gas structured project financings in more detail: future-flow securitizations (Section III); prepaids and volumetric production payments (Section IV); and project finance collateralized debt obligations (CDOs) (Section V). In Section VI, we comment on the role of monoline insurers in project finance and how the downgrades of many of the monolines may impact the project finance business. Section VII concludes.

II. OIL AND GAS PROJECTS AND PROJECT FINANCE

A "project" is usually a large-scale, capital-intensive, long-lived collection of ring-fenced assets, liabilities, and related construction and operation contracts. In the oil and gas market, typical examples of projects include oil and gas exploration projects, drilling platforms and fields, refineries, and distribution networks (e.g., pipelines and storage). Project finance is the extension of credit against the future cash flows of a project as collateral. More specifically, Standard and Poor’s (S&P) defines a project finance transaction as "a cross between a structured, asset-backed financing and a corporate financing... typically characterized as non-recourse financing of a single asset or portfolio of assets where the lenders can look only to those specific assets to generate the flow needed to service the its fixed obligations, chief of which are interest payments and repayments of principal."3

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2. See Figure 21.1.
As Figure 21.1 illustrates, oil and gas projects are second only to power projects as the basis for project finance loans, typically accounting for about 15 to 20 percent of all project finance loans. The typical participants in a capital-intensive oil and gas project are shown in Figure 21.2. These participants can be classified into four different categories (with some participants acting in more than one capacity). These participants and their roles in traditional oil and gas projects are discussed in the sections that follow.

A. "Direct" Project Participants

Most capital-intensive oil and gas projects can be divided into two distinct phases. The first phase (sometimes referred to as precompletion) includes project design, development, construction, and testing. In this phase, most of the project's fixed costs are incurred. Once the project becomes commercially operational and starts to sell its output (a state of completion), the second phase—operation and maintenance (O&M, or postcompletion)—begins. This is usually the first time in the life of a project that any material revenues are generated. Costs are also incurred in this phase, and include variable operating costs, asset and project maintenance, and ongoing risk management expenditures.

The "direct" participants in a project are the organizations that participate in the "bricks and mortar" part of the project, in either the precompletion or O&M phases. The most important direct project participant is the project's sponsor(s). The project sponsor is the company or entity that initiates the project. In the oil and gas industry, project sponsors include integrated oil and gas companies (both corporate and state-owned), exploration and production (E&P) firms, oil and gas reserve owners,
midstream and midmarket oil and gas distributors and processors, refineries, municipalities, and other end users.

In a typical project, the sponsor—working with its bankers, financial advisers, and legal advisers—sets up a special purpose entity (SPE) to house the assets and liabilities of the project. Even if the SPE is a subsidiary of the project sponsor(s), the project SPE is typically a ring-fenced, bankruptcy remote entity.

The project operator manages the assets on an ongoing basis. Operators generally work as contractors to the project, and the sponsor sometimes serves as the contract operator. In addition, project management also often relies on the Build-Operate-Transfer (BOT) model. In this model, a single firm is responsible for building a project and then operating it for a while. After getting the project up and running successfully, the project is then transferred back to its original sponsor.

Capital-intensive projects that require asset development and/or supply chain management over time generally have a prime or general contractor that supervises and/or undertakes the bulk of development work in the project. The prime contractor generally acts as a turnkey, engages other contractors as required, and functions as a type of custodian for the assets of the project. The prime contractor often has an equity stake in the project or is compensated in an equity-like manner (such as bonus or penalty payments based upon the prime contractor's performance relative to required contract performance).

A project might involve a large number of potential service providers, broadly known as contractors. Especially for projects that have a significant amount of construction or physical asset development and maintenance, contractors generally provide most (or all) of those types of services. Contractors are generally engaged by and
responsible to the prime contractor. They are usually compensated at a fixed price and participate in neither the residual risks nor rewards of the project itself. On the contrary, contractors are often a significant source of project risk arising from potential nonperformance.

Projects also invariably involve the purchase of inputs and the sale of outputs. Input suppliers sell or provide goods and services to the project both to facilitate its completion and its ongoing operations. Output purchasers or “offtakers” are the intended purchasers of the output from the completed project. Rarely is a large-scale, capital-intensive project initiated without securing at least informal commitments from a few large potential purchasers in advance, and often these commitments are sought formally through long-term contracting. Committed output purchases mitigate the market risk for the output—if an output quantity is committed, market quantity risk is mitigated; if an output price is committed, market price risk is mitigated.

B. Risk Management Participants

A typical oil and gas project is subject to financial and nonfinancial risks alike. The nature of these risks to which the project’s participants are subject depend largely on the phase in which the project is currently located.

Project completion risks may include liabilities (e.g., workers’ compensation, labor, contractor-related, and environmental), cost overruns, delays, liquidated damages or penalties, and asset destruction (resulting from the likes of catastrophe, terrorism, vandalism, and weather). Or, to put it differently, project completion risk involves the risk that a project will not be finished at all, on time, within budget, or will not perform to expected standards.

Once a project is complete and in commercial operation, the project and its participants face a whole new set of financial and nonfinancial risks. Some of these risks encountered during a project’s O&M phase include the following: loss of revenue from unexpected declines in demand or increases in aggregate supply; unexpected increases in operating costs; asset impairment, degradation, or destruction; loss of revenue from business interruption or lack of business continuity; insecure property rights (e.g., unenforceable patents or other technology rights, political risk, capital controls, and expropriation); labor disputes and local labor management problems; liability (e.g., workers’ compensation, product, and environmental); and financial risks (e.g., interest rate, exchange rate, and commodity price risk).

Insurance and reinsurance companies are often heavily involved in projects as providers of insurance against project completion and O&M risks. In fact, (re)insurers play such a large role in some projects that they become de facto or de jure cosponsors of the project. Some of the roles typically played by a (re)insurance company in oil and gas projects include the following: providing guaranties and sureties for contractors; providing financing guaranties and sureties for credit risk borne by the project (e.g., the risk of nonpayment from precommitted offtakers); liquidity support providers

\[\text{\footnotesize \textsuperscript{4}}\] For a discussion of insurance and reinsurance involvement in project finance, see Chapter 22.
to the working capital layer of a project; and traditional insurance of risks like liability, project completion, errors and omissions, business interruption, and the like.

To address the financial risks inherent in a project, the project participants usually turn to derivatives. Futures, forwards, options, and swaps are popular financial products used for managing project risks related to unexpected changes in interest rates, exchange rates, and commodity prices.\(^5\)

In addition, some projects manage financial risk through their offtake or product sale agreements. Instead of selling output at future spot prices, a project seller may enter into forwards and swaps with output purchasers that call for the delivery of future production at prenegotiated, fixed prices. To address quantity uncertainty, contracts such as take-or-pay contracts may also be used, which enable sellers to lock in the total minimum quantity of production to be delivered over time.\(^6\)

C. Providers of Project Financing

Most of the private sector funds for large-scale projects come from three principal sources: the project equity investor(s); bank lenders; and bond holders. In addition, government-sponsored enterprises and various multilateral agencies also provide project financing, especially in infrastructure-related finance in developing countries.

1. Equity The equity investors in a project are its residual claimants. Equity usually provides about 30 percent of the total financing for a project and might sometimes be held entirely by the project sponsor. If any of the project’s assets already exist at the time the project is initiated, the sponsor can convey those assets to the project SPE. In addition, the sponsor can make further investments in the project SPE to help fund the working capital layer.

In some cases, project sponsors are unwilling or unable to own enough common equity in the project SPE to satisfy lenders’ leverage ratio requirements. In such situations, the project SPE might issue additional equity to outside investors. Such equity offerings often take the form of preferred equity that entitles the holder to a priority for dividends (some or all of which the sponsor may guarantee) and possibly other corporate governance rights (e.g., management participation if preferred dividends are in arrears).

2. Commercial Bank Lenders Commercial banks are the largest providers of funds for large-scale, capital-intensive projects, often accounting for as much as 50 percent of the overall project funds and up to 100 percent during precompletion. Project loans from banks generally take the form of senior loans, both secured and unsecured. Senior secured project loans generally give banks a security interest in the core assets of the project. Typical forms of collateral pledged to creditors in senior secured oil and gas project loans include the following: real estate; mineral and drilling rights; lease rights;

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\(^5\) For a discussion of the use of derivatives in project finance, see Chapter 18.

\(^6\) Id.
licenses, permits, and concessions; and related equipment. In some cases, as we discuss later, collateral also includes a security interest in collections from the sale of related oil and gas.

Unsecured project loans are backed by the general credit of the project SPE and not by a lien or security interest. Nevertheless, by virtue of the ring-fencing of the project itself, senior unsecured project loans are still de facto secured by the project itself. Senior unsecured bank creditors thus are exposed to a much better-defined universe of credit risks in a project financing than in a more traditional unsecured loan to a corporation for general corporate purposes. Some sponsors (e.g., sovereigns) with outstanding debt that is entitled to a negative pledge provision will prefer such senior unsecured project financing because it avoids such negative pledge provisions.

Commercial bank project loans usually have maturities of five to ten years at most. Interest is generally floating based on the London Interbank Offered Rate (LIBOR). Most such loans, moreover, are syndicated. The syndicated loan package usually includes term loans, revolvers, and possibly bridge loan facilities designed to help facilitate subsequent bond financings that follow after completion (because bond holders are less comfortable with construction and other precompletion risks).

3. **Investors in Debt Securities** Debt securities issued by an SPE include short-term commercial paper, medium-term notes, and bonds. Bonds typically associated with oil and gas project financings include fixed- and floating-rate debt, convertibles, Eurobonds, and structured finance issues such as collateralized debt obligation (CDO) notes. Investors in project bonds include pension plans, insurance companies, hedge funds, finance companies, and other asset managers.

Project financing bonds may be taxable issues or tax-exempt securities. Certain types of municipal securities and industrial revenue bonds, for example, are often issued to raise project financing on a tax-exempt basis.

4. **Multilateral Agencies** Especially for quasi-public oil and gas projects, one or more multilateral agencies (MLAs) often play an important role in helping complete a project and/or facilitating its ongoing operations. The World Bank, for example, often takes an active role in the precompletion phases of energy-related projects in the developing world. MLAs also play an important role in projects by either guaranteeing a certain amount of purchases of output produced by the project (either by agreeing to be a project offtaker directly, or helping arrange and secure offtake agreements by providing guaranties and subsidies to actual offtakers). In addition, many MLAs will provide political risk insurance to protect a project participant against the risks of capital controls, expropriation, or other adverse and unexpected political events.

MLAs are also often involved in project financing, especially for projects in developing countries. In addition to providing direct extensions of project credit, MLAs often assist project borrowers by providing credit enhancements or guaranties that enable the project SPE to increase the amount of its total borrowing and/or decrease its cost of debt capital. MLAs often associated with oil and gas projects include the World Bank, International Finance Corporation, regional development banks, export-import banks, and other export credit agencies (ECAs).
III. STRUCTURED FINANCE IN PROJECT FINANCE

As we defined it earlier, project finance is the process of raising capital to finance an economic unit where the assets dedicated to the economic unit and/or the future cash flows from that unit serve as collateral for the financing. Structured finance, by contrast, is the process of raising capital or managing risk through the issuance of securities deliberately designed to satisfy specific needs of the issuer and/or the demands of target investors. Structured project finance, then, can be defined as the amalgamation of the two—the application of securities and derivatives structuring to project financings.

We consider in this chapter three types of structured project finance transactions:

• future-flow securitizations;
• prepaids and volumetric production payment programs; and
• project finance CDOs.

In a perfect capital market with no taxes, no transaction costs, and no costs of financial distress and with equally informed market participants, the above forms of structured project finance would have little value relative to direct financing methods. Indeed, the extra costs often associated with structured financings would probably make it actually unattractive to many firms.

In reality, of course, capital markets are not perfect. As such, institutional considerations like taxes can have a strong impact on some companies' preferred financing techniques, as explored in Chapter 18. Many also consider that reducing the costs of informational asymmetries is one of the main benefits of structured project finance. Informational asymmetries can arise when investors in a firm's securities do not have the same information as firm managers. When investors cannot costlessly monitor managers, they cannot be sure that the actions managers take are in their best interests. This can reduce the price of securities issued by the firm and raise a company's cost of capital.

Some of the reasons that structured finance can make project finance easier, more practical, and, in some cases, cheaper are explored in the sections that follow.

A. Managing and Apportioning Credit Risk Across Participants in a Project

Perhaps the most distinctive feature of project finance compared to direct finance is its nonrecourse nature. Because lenders extend credit to specific projects and not to the sponsor, lenders are less likely to reach credit limits with a sponsor if they are lending primarily to projects affiliated with the sponsor rather than directly to the sponsor.

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itself. Traditional project finance thus already helps lenders and bond holders manage their credit exposures to a sponsor.

Structured project finance goes a step further and helps project sponsors and investors ensure that project risks can be allocated to those participants most able and willing to bear those risks. This can reduce the cost of debt capital for the project by enabling borrowers to obtain credit support from providers with the highest marginal efficiency of capital.

Structured project financing also helps diversify funding sources away from banks, thereby reducing credit concentration inside a given structure. This is good for the project sponsor because it reduces the credit exposure of the structure to the banking sector and diversifies that exposure across multiple sectors of the economy. Funding diversification can also encourage bank participation in a project syndicate by limiting the amount of bank debt and, hence, limiting the total direct credit exposure of a banking syndicate to a project.

B. Preserving Bank Debt Capacity

Bank loans have historically been the largest source of debt financing behind large-scale projects. Yet, banks rely very heavily on short-term financial capital to finance their own operations. Given the long-term nature of large projects, banks are forced to tolerate potentially huge asset/liability mismatches in order to match-fund projects unless some form of refinancing mechanism is available to them. If not, banks must allocate economic capital to their asset/liability mismatch, thus raising project lending costs and restricting project loan availability.

Structured financing can provide banks with a way of synthetically refinancing their project loans, thus allowing banks to treat such loans as shorter-term than they actually are for asset/liability and risk capital management. This, in turn, significantly increases bank capacity to participate in project lending without charging extortionate premiums for the capital they would have to hold against unfunded long-dated loans.

C. Preserving the Sponsor's Debt Capacity

Large, capital-intensive oil and gas projects are natural candidates for project finance principally because project sponsors do not want to incur the significant amounts of balance sheet leverage required to finance these projects "on-balance-sheet." If the sponsor must engage in recourse unsecured borrowing, the resulting increase in leverage could jeopardize sponsor credit ratings, place strains on cash flows and liquidity, and reduce debt capacity (i.e., the ability to engage in additional unsecured financings on short notice without "high leverage" penalties).

D. Mitigating Sponsor "Underinvestment" Problems

Large-scale projects often expose the shareholders and creditors of project sponsors to significant risks. Because financial distress is costly and undesirable, investors in the
sponsor’s securities can sometimes veto positive net-present-value projects because of their risk attributes. Structured project finance reallocates risks and can help sponsors avoid this potential “underinvestment” problem.9

Structured project financing can also help sponsors avoid the deadweight costs of external borrowing used to finance intangible projects with uncertain and subjective values. When investors in the sponsor’s securities cannot verify the quality of the firm’s planned investments, they are less willing to pay a “fair price” for securities that the firm might issue to finance those investments. Because structured project financing can help sponsors finance projects on a nonrecourse basis, there is less need for sponsors to commit their own internal cash resources to those projects. That, in turn, allows sponsors to use their internal cash resources to finance those intangible investments that might be more expensive to finance externally than the sponsor’s ring-fenced project(s).10

E. Reducing Agency Costs of Free Cash Flow

Agency costs arise when principals cannot costlessly monitor the actions of their agents. Manager agents at firms with excessive free cash flows, for example, are often believed to invest that free cash flow in ways that are not always in the interests of the firm’s shareholder principals—e.g., negative net-present-value investments undertaken for managerial “empire building,” perquisites, and excessively indulgent managerial expenditures.11

Structured financing techniques generally involve explicit definitions of cash flow waterfalls and the distribution of project cash flows. Excess cash flows normally considered to be free cash flow in a general corporate structure are often deliberately trapped inside a structured finance waterfall to provide liquidity and credit enhancement to senior liabilities of the structure. As such, structured project financings have less discretionary and free cash flow and thus naturally present project managers with fewer opportunities to make investments that are not in the interests of project owners and creditors.

F. Reducing the Agency Costs of Sponsor Equity

A common problem in project finance is that the project sponsor usually considers its role in the project to be “special.” Sometimes it is—if, say, the sponsor has legitimately vested interests in the project, such as an investment of proprietary technology

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or a large proportion of the input supply or offtake. Sometimes it isn’t—if, say, the sponsor had the idea for the project but has little or no comparative value added beyond that idea and has limited capital to invest. In either case, the feeling that the sponsor’s role is special can give rise to significant agency costs.

A sponsor’s financial participation in a project is reflected by its equity retention. A typical project sponsor often feels “entitled” to all (or most) of the equity but will not be able to retain more than 30 percent or so because of the need for external funds. The sponsor may thus be left with a feeling that its 30 percent stake is really “more important” than just a 30 percent share of common stock in a company. That, in turn, can create pernicious inter-equity agency conflicts and corporate governance problems, often leading to litigation and dispute resolution that can bog down a project.

Structured solutions can help address this problem to some extent by creating a more granular set of financial capital claims on the project. Sponsors, for example, may retain their 30 percent equity stake in the project but be granted 100 percent of the common stock. The remaining equity then could be raised by issuing preference shares—possibly convertible into common to further align interests. Such an arrangement would give the sponsor a dominant controlling role but would not precipitate financial disputes between the sponsor and other shareholders because of the seniority of the preferred shares in capital structure. Or, conversely, in some structures it can make more sense to give the sponsor the preferred layer and to issue the common. That way sponsors can still be financially rewarded but no longer can exert undue governance influence on the program.

Although structuring can help address this problem, it won’t eliminate it. Sound corporate governance— together with a healthy degree of expectation management—is the best antidote to renegade inside equity.

IV. FUTURE-FLOW SECURITIZATIONS

The first type of structured project finance transaction we consider in detail is called a future-flow securitization. A future-flow securitization is a structured project financing in which future revenues are securitized and monetized to raise cash for immediate use by the project sponsor. In many cases, that cash is used to finance the same project that later generates the future flows on which the securitization is based. In other cases, the future flows on one project are securitized to finance a new, but similar, project.

A. Secured Export Notes

A Secured Export Note (SEN) is a bond whose principal and interest (P&I) is secured by a future flow of export receivables. Popular from the mid-1980s until the late 1990s, SENs were issued as direct obligations of the originator—not through an SPE. Although lenders could collateralize their credit exposures with the future exports by the borrower, they were still exposed to the general credit risk of the issuer and had recourse to the sponsor.
Mechanically, the receivables on a future flow of exports are pledged to a reserve account—often housed in a different country than the sponsor/issuer—funded over time as payments for the exports are received by the sponsor. If the exports are sold through prepaid or traditional forward contracts, they are fixed-price sales and thus not subject to the risk of declining export prices. But if the exports are sold at spot (or close-to-spot) prices, the issuer will need to use some kind of traditional derivatives structure to eliminate the spot price risk on the collateral. The possibly hedged funds in the reserve account then serve as collateral to secure the SENs issued by the sponsor.

In July 1993, Corpoven SA—the liquid natural gas (LNG) subsidiary of Venezuelan oil company Petroleos de Venezuela (PDVSA)—issued $275 million in two classes of SENs to raise money to develop the Accrogas LNG Production Complex. The note was supplemented with a $70 million infusion from the sponsor PDVSA and $195 million in export credit loans from three ECAs (COFACE in France, SACE in Italy, and the U.S. ExIm Bank).

Corpoven secured its note issuance with receivables from LNG sales, primarily to Dow Hydrocarbons and Enron Liquids. Market price risk was eliminated by using prepaid forwards to sell the LNG to Dow and Enron. As the prepayments on LNG sales came in over time, those funds were deposited in a special reserve account that backed the Corpoven note issue.

The Corpoven transaction involved two different classes of securities, both of which were direct obligations of Corpoven that gave note holders partial recourse to Corpoven and PDVSA. One class of notes was a $125 million issue of 6.5-year notes paying periodic interest of 250 bps over the Constant Maturity Treasury rate. These notes were distributed through CIGNA to an insurance syndicate and carried a BBB rating. The other class of notes was a $150 million issue of six-year BBB notes paying 225 over LIBOR issued by Banque Paribas to a bank syndicate. Figure 21.3 summarizes the structure.

Figure 21.3 Corpoven Accrogas Secured Export Notes
B. Receivables Securitizations

Toward the mid- to late-1990s, SENs declined in popularity, mainly because investors remained worried about their credit exposures to the balance sheets of project sponsors. To address that concern, a more traditional securitization approach was adopted in which the receivables on a future stream of exports was conveyed to a bankruptcy-remote SPE that, in turn, issued nonrecourse export receivables-backed notes. These future-flow securitizations have become a standard feature in the oil and gas structured project finance landscape. We discuss several typical examples of such programs below.

1. Qatar General Petroleum Corp. Qatar General Petroleum Corp. (QGPC) has been a leader in oil and gas structured project finance since it began to securitize its future flows in the late 1990s. Although its multiple securitizations differ in the details, the structures are broadly similar. The June 2000 securitization of current and future LNG sales receivables, for example, was motivated by a need by QGPC to raise $1.2 billion for a planned expansion of LNG production capacity. The first $800 million for the expansion was raised through two syndicated bank loans, and QGPC went to the capital market for the remaining $400 million.

In this securitization structure (shown in Figure 21.4), receivables from LNG sales to customers were conveyed to QGPC Finance for the price of $400 million. Payments on the receivables were subsequently passed on to an account in the SPE's name. Those receivables and the payments into that collection account acted as collateral for a single class of certificates issued to investors by the SPE for the subscription price of $400 million. Ambac provided a wrap of the certificates to enhance their rating to AAA.

The receivables in this case were largely LNG sales to customers at spot prices. This meant that the P&I on the certificates were subject to the market risk of declining LNG prices. To hedge that risk, the SPE entered into a pay-floating/receive-fixed commodity swap with a swap dealer, allowing the SPE to convert a stream of spot price-based receivables into a stream of fixed-price payments. This mitigated the market price risk on the collateral backing the certificates.

2. Delek & Avner—Yam Tethys In the previous example, the future-flow securitization by QGPC was motivated by a financing need to raise cash for expanding LNG production capabilities. Future-flow securitizations are also often used as a way to refinance bank debt and other traditional project financing sources secured in a project's early phases. As an example, consider the February 2005 offering of $275 million in senior secured notes by Delek & Avner—Yam Tethys Ltd.

Yam Tethys is an unincorporated joint venture that owns and operates an Israeli natural gas production facility. The Yam Tethys project is operated by Noble Mediterranean Ltd., which also holds a 47 percent interest in the Yam Tethys joint operating agreement. The remaining 53 percent is held by three entities in the Israeli Delek Group Ltd.—Delek Drilling, Delek Investments, and Avner Oil (the Delek Sponsors). Natural gas drawn from Yam Tethys is sold to Israel Electric Corp. Ltd. (IEC) through a ten-year take-or-pay gas sale and purchase agreement (GSPA) with a total deliverable quantity of 18 billion cubic meters (bcm).
The Delek Sponsors issued $275 million in notes to a financing SPE called Delek & Avner—Yam Tethys Ltd. in exchange for $275 million in cash. The notes were secured by the Delek Sponsors’ 53 percent interest in the Yam Tethys project (including its share in the GSPA receivables) as collateral. Those secured notes, in turn, were pledged as collateral for the $275 million senior secured note issue, the proceeds from which were paid to Delek Sponsors to purchase the Delek Sponsors’ notes. In addition, the Delek Sponsors entered into commodity swaps with J. Aron and novated the swaps to the SPE to manage the risk that falling gas prices would reduce the revenues from the sale of natural gas to IEC under the GSPA. Figure 21.5 graphically illustrates the various arrangements.

The principal use of the proceeds from the $275 million debt issuance was the Delek Sponsors’ repayment of $106 million in debt they had incurred earlier in the Yam Tethys project. In addition, they used $26.5 million of the proceeds to fund a bank guaranty to IEC to cover the Delek Sponsors’ portion of a required $50 million credit enhancement. Another $37.3 million was used to fund letters of credit drawn on Bank Leumi and Bank Hapoalim and posted to J. Aron as credit enhancements for the commodity swap hedges. The rest of the funds were used to fund a debt service reserve account, make a distribution to the Delek Sponsors, and prefund future project-related O&M expenditures.

V. PREPAYS AND VOLUMETRIC PRODUCTION PAYMENTS

Buying a commodity for future delivery at a fixed price set in advance—i.e., going “long a forward”—is economically equivalent to buying the commodity for immediate delivery and storing it over time. The total purchase cost is equal to the original
Figure 21.5 Delek & Avner–Yam Tethys Ltd. Natural Gas Receivables Securitization

purchase cost at the spot price plus the interest cost of financing the purchase plus the physical cost of storage minus any benefit to be had from actually having the asset on hand. In a traditional forward contract, the long purchaser pays for the asset on the same future date the asset is delivered by the seller. In a prepaid forward contract, the purchaser pays for its future delivery at the beginning of the transaction instead, and thus is essentially combining a traditional forward with a money loan to the asset seller. This transaction is project or principal finance by any other name.

How this sort of “synthetic” project finance is executed in practice is, of course, more complicated. The sections below explore several different variations on this synthetic project finance theme.

A. Synthetic Project Financing Structures and Sources of Funds

Using a prepaid as the basis for synthetic project financing can involve as many as five different pieces that together form a single structure. These pieces are as follows:

* **Prepaid Leg:** An asset purchaser—often an SPE—makes an up-front cash payment to the asset seller (i.e., project borrower) in return for a commitment to a future delivery or deliveries of the asset. The prepaid is documented as a derivatives contract and receives accounting and tax treatment as a derivatives transaction. If the prepaid purchase is associated with a single future delivery, the transaction is a prepaid forward. Most of the time, however, a single prepayment is made for a series of
future deliveries—e.g., deliveries once a month for a year beginning five years hence. In the latter case, the derivatives contract is a prepaid swap.12

- **C/E (Credit Enhancement) Leg:** The prepaid asset purchaser bears significant credit risk by paying for an asset now that the seller commits to deliver later. The buyer, moreover, does not have a first-interest lien perfected in the underlying asset when buying the asset forward. So, the buyer will demand some form of significant C/E from the seller to secure the delivery obligation, usually in the form of a letter of credit.

- **Offtake Leg:** The buyer of the asset is rarely an end user of the asset, especially when the buyer is an SPE established solely to facilitate a synthetic commodity financing structure. A typical synthetic financing structure thus also includes an offtake agreement, or an agreement through which the asset purchaser or SPE sells the asset when it is delivered by the seller/borrower. The offtake agreement may be a take-or-pay contract, a forward or swap, an option, or simply a future transaction on a spot or futures market.13

- **Hedge Leg:** Depending on whether the offtake agreement is a fixed-price sale agreement, the SPE buyer of the asset may be exposed to the risk of price declines in the asset over the life of the prepaid. A fixed-price offtake agreement will hedge that risk, but a variable-price offtake or a future spot market sale will require the SPE to hedge this market risk with a traditional forward or swap.14

- **Financing Leg:** The SPE purchasing the asset generally borrows these funds from one or more lenders. The future delivery obligations plus the C/E are posted as collateral for the loan. The financing for the structure can be provided by a bank or insurance company, a syndicate, or through a securitization of the hedged, credit-enhanced future flow.

Figures 21.6 through 21.8 show three common variations of the above legs. In Figure 21.6, the SPE takes physical delivery of the asset over time, sells the asset on the spot market, and hedges that spot price risk with a traditional (not prepaid) pay-floating commodity swap or forward. In Figure 21.7, by contrast, the offtake agreement is itself a fixed-price forward sale, often executed as a prepaid swap. This means that the SPE asset purchaser need not hedge any longer. But notice this just pushes the hedging problem one level down—the counterparty to the offtake agreement is now bearing that market risk, and it will likely enter into a commodity price hedge. And in Figure 21.8, the lender assumes both the offtake and hedging responsibilities. Instead of extending a money loan to the SPE secured with the future deliveries on the SPE’s prepaid asset purchase, the bank simply enters into a mirroring prepaid with the SPE. The lender is then left to dispose of the asset and hedge the market risk of that future asset sale. In any case, there can be counterparty risk with respect to one of more of the legs and careful consideration should be given thereto; especially, if the contract is for a material term or the counterparty may be subject to volatility in, or suffer a degradation of, its creditworthiness.

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12 For a discussion of forward contracts and swaps, see Chapter 18.
13 For a discussion of offtake agreements, see Chapter 20.
14 See Chapter 15.

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In any of the above structures, a single bank or bank syndicate—or perhaps (re)insurance companies—can serve as the synthetic project financier. But the synthetic structure also naturally lends itself to fund-raising through a future-flow securitization, where the future flow is the hedged revenue stream associated with the future commodity deliveries.

**B. Municipal Natural Gas Prepaids and Gas Supply Revenue Bonds**

Beginning in the late 1990s, certain U.S. municipalities began to finance long-term prepaid natural gas purchases by issuing tax-exempt municipal bonds known as gas supply revenue bonds. In a typical such municipal prepaid, a municipal utility or “joint action agency” creates an SPE that issues tax-exempt bonds. The proceeds of the

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bond issue are used to finance a prepaid natural gas supply agreement in which a gas supplier—usually the commodities trading desk of a swap dealer—commits to deliver natural gas for ten to thirty years. Gas deliveries can be scheduled ratably or tailored to anticipated gas usage. The gas purchasers are municipal utilities that distribute natural gas to retail customers or for electricity generation. These utilities purchase gas at a floating price, and the SPE swaps those floating payments for fixed to hedge the natural gas price risk in the structure.

The difference between the gas supplier’s cost of capital and the cost of the tax-exempt bonds generates a positive net cash flow inside the structure—i.e., the fixed payments received by the SPE are slightly higher than the interest payments owed on the tax-exempt debt. The surplus is accumulated in a reserve and refunded to municipal utility gas purchasers in the form of an annual rebate, thus reducing the all-in purchase price paid by the municipal utilities for their natural gas supplies.

Unlike the generic prepaid structures shown in Figures 21.6 through 21.8, the credit risk of the gas supplier is not generally addressed with an explicit credit enhancement in the municipal prepaids. Because of the preponderance of low-rated or unrated municipal utilities, however, municipal prepaids generally involve some kind of credit enhancement for the municipal participants. If the utilities are unable to purchase the contracted amount of gas over time, the credit enhancement guarantees that funds will still be available to pay off the gas supply revenue bonds. Other aspects of credit risk in municipal prepaid structures are generally mitigated contractually through the use of remarketing agreements, reserve accounts, and the like. As a result, municipal prepaid revenue bonds often have a rating that is the same as or slightly below the gas supplier.

Certain municipal prepaid structures have been particularly hard hit by the current credit crisis as a result of strains on both financial institutions acting as gas suppliers.

For a discussion of the various credit enhancements used in municipal prepaid structures, see Standard & Poor’s, All U.S. Prepaid Natural Gas Transactions Are Created Equal...Or Are They? RATINGSDIRECT (Sept. 17, 2007).

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**Figure 21.8** Prepaids Where Bank Lender Assumes Offtake and Hedging Responsibilities
and on financial guarantors in the insurance industry. We review two transactions to illustrate how significantly the source of credit enhancement in prepaids can affect the risk borne by bond holders.

1. Main Street Natural Gas, Inc. Main Street Natural Gas, Inc. (Main Street) is an SPE that the Municipal Gas Authority of Georgia (the Gas Authority) established to deliver natural gas to municipal participants. From 2006 through 2008, Main Street issued a total of $2.26 billion in gas supply revenue bonds. The most recent issue—completed in February 2008—was a $350 million issue of Series 2008A revenue bonds. In mid-April 2008, the size of the bond issue was increased to $709 million.

Figure 21.9 illustrates the mechanics of the transaction at closing. Under the gas supply agreement, Lehman Brothers Commodities Services agrees to deliver 10,000 million British thermal units (mmBtu) of natural gas daily to Main Street for its onward distribution to the City of Tallahassee, Florida. In addition, Lehman agrees to deliver seasonally adjusted amounts of gas to Main Street for twenty years for onward distribution to the Gas Authority and the Reedy Creek Improvement District (RCID). In return for these deliveries, Main Street remits the majority of the proceeds of its gas supply revenue bond issuance to Lehman as a prepayment.

The three municipal gas purchasers entered into agreements with Main Street to buy gas in the same quantity and for the same duration as the gas supply agreement between Main Street and Lehman. Those municipal purchasers pay a floating amount to Main Street each month equal to the current natural gas price minus a discount that reflects the difference between the cost to Lehman of acquiring the gas and the tax-exempt funding cost on the gas supply revenue bonds. Main Street then swaps out those floating payments to Calyon for a monthly fixed payment adequate to meet its debt service requirements on the revenue bonds.

Figure 21.9 Main Street NG Prepaid Series 2008A
PREPAYS AND VOLUMETRIC PRODUCTION PAYMENTS

In this structure, virtually all of the credit enhancements were provided by Lehman Brothers. Lehman Brothers Commodities Services agrees to make “mandatory advances” that are sufficient to cover most shortfalls in Main Street’s debt service requirements that might arise from a failure of a municipal participant to pay for its gas purchases, or a failure of Calyon to make its required swap payments. In turn, the obligations of Lehman Brothers Commodities Services were guaranteed by Lehman Brothers Holdings, Inc. (LBHI).

Not surprisingly, the gas supply bonds were rated A+ when they were issued, which was the same rating as LBHI at that time. S&P explained that its “ratings on this prepaid transaction will be linked to LBHI as the ultimate counterparty in the transaction that must perform for timely principal and interest payments to be made to bondholders.”

Also not surprisingly, the rating of the 2008A Main Street bonds followed the unfortunate path of Lehman Brothers. LBHI was downgraded from A+ to A on June 2, 2008, and the 2008A Main Street bonds were downgraded from A+ to A two days later. When LBHI filed for bankruptcy protection on September 15, 2008, the Main Street 2008A issue was downgraded to CCC-. On September 23, 2008, S&P cut Main Street’s 2008A series gas supply bond rating to D after Lehman Brothers Commodities Services failed to make any required gas deliveries for five days and defaulted on its gas supply agreement. Of course, this “problem” has affected all similar credit enhancement arrangements made by Lehman, including certain catastrophe bonds as well as other structured finance transactions.

2. Clarksville Natural Gas Acquisition Corp. In June 2006, the Natural Gas Acquisition Corp. of Clarksville (NGAC) issued $240.055 million in gas supply revenue bonds. Most of the bond proceeds financed a prepayment by NGAC to Merrill Lynch Commodities, Inc. (MLCI). In return, MLCI committed to supply 41.05 mmBtu in natural gas over fifteen years, which NGAC would resell to the City of Clarksville and the neighboring Humphrey County Utility District.

The NGAC structure—depicted in Figure 21.10—did not involve (or require) a separate hedging leg. The municipal purchasers—the City of Clarksville, Tennessee, and the Humphrey County Utility District—make a floating payment to NGAC each month equal to the floating price of natural gas minus a discount. NGAC, however, entered into an agreement with MLCI for monthly settlements, based on fluctuations in natural gas prices over time. If spot prices exceed the projected price reflected in the initial prepayment, NGAC must make periodic settlement payments to MLCI. Conversely, if spot prices fall below the projected price, MLCI must deliver additional

17 Standard & Poor’s, Presale: Main Street Natural Gas Inc. 2008A (Gas Prepay), RatingsDirect 5 (Feb. 15, 2008).
18 Standard & Poor’s, Research Update: Main Street Natural Gas’ 2008A Bonds Rating Lowered to “A”; Outlook Negative, RatingsDirect (June 4, 2008).
19 Standard & Poor’s, Research Update: Main Street Natural Gas’ 2008A Bonds Rating Lowered to “CCC-” After Lehman Bros Files Bankruptcy, RatingsDirect (Sept. 15, 2008).
20 Standard & Poor’s, Research Update: Main Street Nat Gas 2008A Bonds Rtg Cut to “D” on Persistent Delivery Failure and Termination, RatingsDirect (Sept. 23, 2008).
natural gas volumes to NGAC. In this manner, NGAC and the gas supply bond holders are insulated from fluctuations in natural gas prices.

Credit enhancements in the NGAC structure were provided in several different forms. First, the gas supply agreements between NGAC and the municipal participants include minimum purchase requirements sized to meet minimum debt service requirements. Second, instead of making payments for gas deliveries to NGAC, municipal participants make payments to a “lock box” revenue account maintained by Wells Fargo Bank N.A. acting as the gas supply bondholders’ trustee. Third, excess cash flows were allocated to a $2.5 million operating debt service reserve to cover any liquidity shortfalls. Wells Fargo entered into guaranteed investment contracts with Wachovia Bank for the debt service account. Fourth, deliveries or required termination payments on the gas supply contract between MLCI and NGAC were guaranteed by MLCI’s parent Merrill Lynch & Co., Inc. (Merrill Lynch). And finally, XL Capital Assurance (XLCA) provided a financial guaranty that unconditionally and irrevocably covered the two municipal participants’ payment obligations to NGAC, as well as NGAC’s settlement payment obligations to MLCI. In return, XLCA was paid a fee out of the proceeds of the gas supply revenue bond issuance.

Based on the usual “weak link” approach of the rating agencies, the NGAC 2006 gas supply revenue bonds were originally rated A+ based on the rating of Merrill Lynch. Nevertheless, as Merrill Lynch came under pressure and was eventually acquired by Bank of America, the NGAC 2006 gas supply revenue bond ratings were not downgraded. Similarly, the bonds also survived the rating actions and pressures on Wachovia, the guaranteed investment contract provider. In both cases, the rating agencies...
deemed the guaranties provided by XLCA (by then renamed Syncora Guarantee, Inc.) to be an adequate source of protection for bond holders.

The NGAC 2006 bonds did not, however, survive the problems encountered by XLCA/Syncora. On February 27, 2009, S&P downgraded the NGAC 2006 bonds from A+ to A- following XLCA’s downgrade to A- two days earlier.21 On June 9, 2008, the bonds were downgraded to BBB-, again following XLCA’s downgrade to BBB-.22 Syncora’s rating was downgraded to B on November 18, 2008, and again downgraded to CC on January 29, 2009. On January 29, S&P withdrew its rating of the NGAC 2006 gas supply bond on the grounds that “NGAC has not incorporated structural enhancements to address the Nov. 18, 2008, downgrade of the financial strength rating on Syncora Guarantee Inc. (formerly XL Capital Assurance Inc.) nor has greater clarity related to the credit risk of the municipal participants been achieved. The downgrade of Syncora to ‘CC’ further exacerbated concerns related to its participation in the NGAC transaction.”23

C. Volumetric Production Payments

A volumetric production payment (VPP) is a structure in which an oil or gas purchaser advances up-front funds to a seller in return for a nonoperating interest in oil or gas properties that is determined by a specified quantity of related oil and gas production. Accordingly, most VPPs are based on existing oil and gas properties and interests already in production and for which there are accurate production histories and reliable reservoir estimates. The future sales of oil or gas from the property or interest are used to repay the advance. When the prespecified amount of cash or equivalent production has been paid or transferred to the buyer, the VPP terminates and the nonoperating interest reverts to the seller.

VPPs have been popular with oil and gas E&P companies, primarily as a way to preserve or increase debt capacity. In addition, VPPs are often structured so that non-operating interests in the properties are nonrecourse to the seller, thereby significantly reducing the credit risk of the oil or gas buyer in the VPP (as compared to unsecured lending to the seller).

In a typical VPP, a financial institution purchases a nonoperating interest in an E&P company’s specific properties or reserves (perhaps ring-fenced in an SPE) for an up-front cash payment. In return, the financial institution receives royalties based primarily on the future sale of the hydrocarbon reserves in the spot market. To hedge the price risk, the financial institution enters into a commodity swap. A VPP thus is economically similar to a prepaid cash-settled forward/swap transaction.

21 Standard & Poor’s, Research Update: Rating on Clarksville Natural Gas Acquisition’s $240.1M Bonds Lowered to “A-”: On Watch Neg, RATINGS DIRECT (Feb. 27, 2008).
22 Standard & Poor’s, Research Update: Rating on Clarksville Natural Gas Acquisition Bonds Ratings Lowered to “BBB-”: Still On Watch Neg, RATINGS DIRECT (June 9, 2008).
23 Standard & Poor’s, Research Update: Rating on Clarksville Natural Gas Acq Corp. Prepaid Transaction Withdrawn, RATINGS DIRECT (Jan. 29, 2009).
To raise the funds advanced by the buyer to the seller in a typical VPP, the buyer often syndicates the credit, or securitizes its receivables, from the SPE. Figure 21.11 shows a VPP securitization in which the hedged royalty payments by the operating SPE to the financial institution are conveyed to a financing SPE. The financing SPE purchases the hedged VPP receivable from the bank using the proceeds of a note issuance, and the VPP receivable serves as collateral for those notes.

Enron’s VPP securitization program was highly successful in the 1990s. The VPP sellers were primarily fledgling or struggling natural gas companies that were poor candidates for full-recourse unsecured credit. Because of concerns about the overall credit quality of those firms participating in the VPP program, Enron required each sponsor firm to ring-fence the natural gas production assets for which they were seeking financing in a single bankruptcy-remote project SPE or a single securitization group. Enron then advanced cash to the ring-fenced SPEs using VPPs.

In one specific example, Enron established the Cactus Funds SPE to which the future flows on the VPPs were conveyed. The cash proceeds from the conveyance financed the advances on the VPPs. To raise the funds required to purchase the VPP receivables, Cactus issued two classes of securities whose cash flows were backed by the proceeds from the VPPs.

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D. The Enron-Mahonia Prepaids

When Enron failed in December 2001, it had about $15 billion in cash prepayments from JPMorgan Chase and Citigroup booked against future oil and gas deliveries. Over time, Enron had entered into similar deals with other banks, including Credit Suisse. An analysis of the different types of credit enhancements Enron provided to these banks—and how they worked following Enron's bankruptcy—is a useful reminder of the importance of the credit enhancement leg in a prepaid transaction.

To facilitate our analysis of this specific problem amidst a highly complex set of transactions with numerous facts still unknown (some of which are still being litigated), we examine a “representative transaction” similar to the later deals conducted between JPMorgan Chase, Enron, and an SPE called Mahonia. This transaction structure is simplified for presentation and analysis purposes and is not intended to represent a specific deal between Enron and any particular bank.

Figure 21.12 shows our representative Enron Mahonia deal, in which the bank lender is JPMorgan Chase (JPMC, or Chase). Mahonia Ltd. was a Channel Islands SPE set up at the behest of Chase in December 1992. Mahonia was not specifically established to conduct transactions with Enron, but rather was originally established as a vehicle by which deliveries from Chase customers could be made without posing regulatory problems for Chase as a national bank.25

The transactions as originally contemplated did not proceed. But when Enron approached Chase to do a prepaid in June 1993, Mahonia was identified as a suitable vehicle for conducting that transaction. Between 1993 and 2001, JPMC and Enron negotiated at least twelve prepaid deals.

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25 Under banking regulations prevailing in the early 1990s, national banks like Chase were limited in their ability to make and take physical commodity deliveries.
STRUCTURED FINANCING TECHNIQUES IN OIL AND GAS PROJECT FINANCE

The representative deal shown in Figure 21.12 is similar to a deal done in late 1998 in which Enron North America accepted a prepayment from Mahonia in return for committing to deliver crude oil periodically over time. Financing was provided by JPMC in the form of a mirroring prepaid, in which JPMC advanced cash to Mahonia in return for Mahonia passing on the future crude deliveries from Enron. JPMC then planned to sell the crude oil back to Enron at the spot price. The hedge consisted of a pay-floating commodity swap—also with Enron—that locked in JPMC’s sale price for the future crude deliveries. As a credit enhancement, Enron Corporation guaranteed Enron North America’s future deliveries and backed up its guaranty with an external credit enhancement.

1. Advance Payment Supply Bonds

In the early Mahonia deals, Enron pledged bank letters of credit to back up its own guaranty to Enron North America. In the event of Enron’s inability to pay, the cash equivalent of the remaining deliveries could be settled by Mahonia or JPMC drawing down the letter of credit.26 Beginning in 1998, Enron asked JPMC to let Mahonia accept so-called “advance payment supply bonds” (APSBs) in lieu of letters of credit for the Enron-Mahonia prepaids. APSBs were essentially surety bonds on which JPMC could draw if Enron failed to make scheduled deliveries to Mahonia. JPMC was initially hesitant to accept surety bonds in lieu of letters of credit. To assuage its concerns, the bank requested that all the sureties backing the Enron APSBs provide several forms of assurance that the APSBs “would be the functional equivalent of letters of credit, and, like letters of credit, would constitute absolute and unconditional pay-on-demand financial guarantees...”27 These assurances were apparently provided, and with JPMC’s consent, APSBs began to replace letters of credit as collateral pledged to Mahonia APSB providers were all multiline insurance companies, most of which were domiciled in New York.

On December 7, 2001—five days after Enron filed for bankruptcy protection—JPMC filed written notice with Enron’s sureties of the nearly $1 billion due to Mahonia and JPMC under the APSBs. The sureties declined payment, arguing that the APSBs “were designed to camouflage loans by [JPMorgan] Chase to Enron, and that [JPMorgan] Chase defrauded the surety bond providers into guaranteeing what were purely financial obligations which they otherwise would not, and statutorily [under New York law] could not, have bonded.”28 In other words, the sureties claimed that because the prepaids were “bank debt in disguise,” the APSBs represented financial guarantees that could not be offered by multiline insurers under New York Insurance law.

Figure 21.13 illustrates what the surety providers had asserted. The dashed gray lines show the flows of crude oil, and the dashed black lines indicate the floating spot price-based payments between Enron and JPMC on its crude oil sale and swap. In short, the

26 As a practical matter, Mahonia would have given JPMC a security interest in the credit enhancement as collateral for its own mirroring prepaid with JPMC.
surety providers argued that the movement of crude oil from Enron to Mahonia to JPMC and back to Enron was circular, primarily because Mahonia was really just an unconsolidated subsidiary of JPMC disguised as a separate company. As a result, the crude deliveries “cancel out,” as do the floating crude price–based payments. What is left over is just the up-front payment from JPMC to Mahonia that funds Mahonia’s up-front payment to Enron (which the insurers contend was really just a payment from JPMC to Enron) and a later series of fixed payments from Enron directly back to JPMC.

The surety providers contended that the combined structure represented a financial transaction, not a commodity transaction. Because only monoline insurance companies are permitted under New York law to provide financial guaranties, the sureties argued that they thought they had been underwriting legitimate sureties of physical commodity deliveries when they were providing illegal and unenforceable financial guaranties instead.

On January 2, 2003, JPMC announced a $1.3 billion charge in the fourth quarter of 2002 largely to reflect Enron litigation matters. That charge-off reflected a settlement with insurers, reached on the same day the trial was to begin. Under the settlement, the eleven insurers agreed to pay about 60 percent of their obligations to JPMC under the APSBs, or $655 million out of the $1 billion total owed.

2. Letters of Credit. The last of the twelve deals entered into between JPMC, Mahonia, and Enron was a $350 million prepaid deal that closed in September 2001 just weeks before Enron filed for bankruptcy. Unlike every prior deal, “Mahonia XII” consisted of three entirely cash-settled swap transactions, shown in Figure 21.14.29

The first swap was a prepaid swap between Mahonia and Enron in which Mahonia paid $350 million in return for a promised future cash payment tied to the future market price of natural gas. The second swap was a mirroring prepaid swap between JPMC

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29 Whether or not physical product actually flowed in any if the earlier deals is unclear, but in Mahonia XII it was not even intended to do so.
and Mahonia in which JPMC paid $350 million to Mahonia up front, in return for the right to receive in the future a floating cash payment tied to the natural gas price. Finally, the third swap was a traditional (not prepaid) swap between JPMC and Enron in which JPMC made floating payments tied to future natural gas prices in exchange for a fixed $356 million cash payment from Enron.

The credit enhancement for this deal consisted of a $165 million letter of credit (LOC) provided by West Landesbank (WestLB). Mahonia demanded a draw on the WestLB LOC on December 5, 2001, but WestLB disputed its payment obligation. The situation is similar to the dispute in New York between JPMC and the surety providers, except, importantly, the legality of APSBs is not relevant here and was not a part of WestLB’s arguments in support of its nonpayment. Instead, WestLB simply claimed that it was a victim of fraud. First, JPMC and Mahonia were alleged to have conspired to hide the true nature of the three swaps together as a bank loan in disguise. Second, these transactions had not been properly accounted for under U.S. Generally Accepted Accounting Principles. And third, WestLB had been fraudulently induced to provide the LOC under circumstances of which it was not made adequately aware.

On August 3, 2004, in the U.K. High Court of Justice, Judge Cook ruled against WestLB and instructed it to honor the draw on its LOC. This dismissal of WestLB’s claims was based primarily on the view that Mahonia was an independent corporation, not an unconsolidated subsidiary of JPMC, and that the three swaps were independent transactions. The fact that these three swaps netted down to a fixed-for-fixed payment ex post did not invalidate the swaps’ independence as three, stand-alone agreements ex ante.

VI. PROJECT FINANCE CDOs

A CDO is a securitization structure that repackages the credit risk associated with an underlying portfolio of bonds or loans. CDOs backed by bonds are sometimes called collateralized bond obligations (CBOs), and CDOs with loans as the primary type of underlying collateral are known as collateralized loan obligations (CLOs).
Project finance CDOs are CDOs backed by project loans, bonds, or lease collateral. Project finance CDOs are particularly appealing as a means by which project lenders can synthetically refinance their project finance portfolios. Because project finance CDOs provide investors with access to a diversified portfolio of project finance debt obligations, project lenders can find it easier to refinance by selling to such a CDO than if each specific credit exposure had to be individually sold or refinanced. As such, the sale of a project finance portfolio expands the seller’s opportunity to undertake additional project finance business with favored existing clients or new borrowers. In addition, project finance CDOs enable financial institutions to manage their exposures to particular countries, industries, and credits, enabling banks to achieve better economic results than they could if they sold the loans in secondary transactions.

From an investor’s perspective, an investment in the CDO securities of a project finance CDO provides diversification and other portfolio management benefits, including a low correlation to typical corporate bond portfolios held by most institutional investors. The tranched structure of CDOs, moreover, enables investors to determine their preferred risk/return investment because an investment in the junior tranches of a CDO represents a more leveraged exposure to the underlying CDO portfolio and correspondingly greater risk for the stated return.

A. Project Finance CDOs in General

The core concept of CDOs is that a pool of defined debt instruments will perform in a predictable manner (i.e., with default rates, loss severity/recovery amounts, and recovery periods that can be forecast reliably). With appropriate levels of credit enhancement, CDOs can be financed in a cost-efficient manner that reveals and captures the "arbitrage" between the interest and yield return received on the CDO’s assets, and the interest and yield expense of the CDO securities issued to finance them.

Typically, CDOs require the CDO assets to meet certain eligibility criteria (including diversity, weighted average rating, weighted average maturity, and weighted average spread/coupon) in accordance with established rating-agency methodologies. This ensures the highest practicable rating for the related CDO securities. A CDO allocates the interest and principal proceeds of such assets on periodic distribution dates according to certain collateral quality tests (typically an overcollateralization ratio and an interest-coverage ratio).

CDO securities are usually issued in several tranches. Each tranche (other than the most junior tranche) has a seniority or priority over one or more other tranches, with tighter collateral quality tests set to trigger a diversion of interest and principal proceeds that otherwise would be allocable to more junior tranches, which then are used to redeem or otherwise retire more senior tranches. Subordination of junior tranches constitutes the required credit enhancement for the more senior tranches and allows the CDO securities of such senior tranches to receive a credit rating that reflects such seniority or priority. Some CDOs use financial guaranties or insurance for the same effect.
The underlying CDO assets affect the capital structure of the CDO. For example, if the underlying debt obligations are floating-rate, the CDO securities should also be floating rate or must be swapped to avoid or minimize the interest-rate mismatch. If the underlying CDO assets require additional advances (e.g., construction or postcompletion working-capital facilities), the CDO securities should allow subsequent borrowings so the CDO can make the required advances.

CDO securities are often held by commercial paper conduits that offer attractive pricing and flexible funding. The conduit, however, will likely require a minimum rating of such CDO securities, and the CDO will require a minimum rating of the conduit (which if “lost” effectively requires the conduit to find a replacement or to post collateral to cover the obligation to make borrowings). Obviously, these complex mechanics can be avoided if the CDO holds only fully funded debt obligations.

Project finance loans, leases, and other debt obligations are viewed as attractive assets for CDOs because they have higher assumed recovery rates and shorter recovery periods than comparably rated corporate debt obligations. This allows project finance CDO securities to be issued at a correspondingly lower cost (because less credit enhancement is required to obtain the same credit ratings), which effectively “expands” the arbitrage opportunity for such CDOs.

The higher assumed recovery rates and shorter recovery periods of project finance debt are primarily attributable to the tighter covenants and events of default under typical project finance documentation. These assumptions are intuitively reasonable and, most importantly, the rating agencies concur with them, even though there appears to be no great weight of authoritative research to support these assumptions.

As one might expect, applying the rating-agency requirements for diversification to a project finance portfolio can present certain challenges, including whether diversification is effectively provided across industries and/or countries, for which there usually is little (if any) empirical evidence and which, accordingly, requires educated judgments. For example, are loans to power projects in Brazil and Argentina effectively diversified, given the substantial interaction between the energy sectors in these two countries?

For these reasons, it is unusual to find project CDOs in which the loan collateral consists solely of project loans in a specific industry. Indeed, rating agency criteria tend to penalize CDOs that are excessively concentrated in one industry. We know of no project loan CDOs specifically concentrated in oil and gas project loans. Nevertheless, the benefits of applying CDO technology to oil and gas project loans as a part of broader project finance securitizations are sufficiently pronounced that the general project CDO framework merits discussion.

B. Project Finance CLOs

CLOs collateralized by project finance loans can be either cash or synthetic CLOs. In a typical cash CLO, the SPE purchases whole loans or loan participations, with the cash to finance the purchase of those loans raised by issuing liabilities collateralized by the loan assets. In a synthetic CLO, by contrast, the SPE acquires exposure to the
underlying loan portfolio synthetically through the sale of credit protection on that reference portfolio.

The earliest project finance CLOs were cash securitization structures in which the SPE purchased the loans (or loans participations) as collateral for the CLO note issues. Project Funding Corp. I (PFC I), for example, was one of the earliest such cash project finance CDOs that closed on March 5, 1998. Sponsored by Credit Suisse First Boston, PFC I issued about $617 million in debt and equity securities collateralized by a portfolio of about forty loans made primarily to U.S. projects.

Other cash project CDOs have included Project Funding Corp. II (2000)—also based on project loans made by Credit Suisse—and Project Securitization Company I (2001), based on an international portfolio of project loans made by Citibank. More recently, Lusitano Project Finance I Ltd. (closed in December 2007) was based on twenty pan-European infrastructure asset exposures of Banco Espirito Santo. Lusitano I was a mixed-asset CLO in which the majority of loans were converted into listed securities (probably for related exemptions from withholding tax) prior to their acquisition by the SPE issuer. The SPE purchased the remainder of the loans directly.

Most of the project finance CLOs in the last five years have been synthetic CLOs in which exposure to the underlying loans is acquired through the SPE’s sale of credit protection on those reference loans using credit default swaps. The first such transaction was Essential Public Infrastructure Capital PLC (EPIC) deal that closed in late 2004—see Figure 21.15. The reference collateral portfolio in EPIC was a portfolio of twenty-five public infrastructure loans originated by Depfa Bank PLC worth £391.7 million. All loans were part of either the U.K.’s Private Finance Initiative (PFI) or Public Private Partnership (PPP) program. Any individual PFI or PPP project is a public infrastructure or works project housed in a separate SPE and financed by private sector funds under a special government-granted concession arrangement with the SPE.

EPIC involved the issuance of £32.05 million in six classes of floating-rate notes by the SPE Essential Public Infrastructure Capital PLC. To collateralize those securities, the SPE purchased £32.05 million in Schuldscheine—essentially a type of credit-linked note (CLN)—from KfW Föderbank (KfW), the infrastructure lending unit of Kreditanstalt für Wiederaufbau. The reference portfolio to which the CLNs were indexed was the £391.7 million Depfa project loan portfolio.

KfW invested the CLN issue proceeds in marketable securities and then sold credit protection to Depfa on the first £32.05 million of losses in its reference loan portfolio. With no events of default, the Schuldscheine paid interest to the SPE equal to the interest earned on the low-risk collateral plus the CDS premium collected by KfW. In the event of a default, P&I on the Schuldscheine could be withheld to fund CDS payments up to the face value of the FRNs issued by the SPE and Schuldscheine issued by KfW. The Schuldscheine were issued in six classes that were exactly matched in size and subordination to the six classes of FRNs issued by the SPE.

In addition, KfW also sold protection to Depfa on the £355.7mn XS £32.05mn super-senior piece of its reference loan portfolio, hedging that super-senior swap by entering into a mirroring CDS as the credit protection purchaser with Ambac Assurance.

When the EPIC transaction closed, Depfa had over EUR 3 billion committed to European PPP loans. In addition, Depfa’s infrastructure loan book included significant
extensions of credit to Japan and North America. As such, the EPIC transaction provided Depfa with capacity relief that enabled the bank to make additional project loans without jeopardizing its AA- rating or putting undue stress on its liquidity position. In addition, EPIC enabled Depfa to reduce its risk-weighted assets by about EUR 500 million. That reduced the bank’s regulatory capital requirement and increased its return on equity on its infrastructure finance portfolio.30

In Standard & Poor’s view, EPIC “established a template for future deals.”31 And, indeed, subsequent synthetic deals closely followed the EPIC template, including Stichting Profile (2005), EPIC II (2006), and Boadilla Project Finance (2008). In the Boadilla Project Finance transaction, Banco Santander transferred a portfolio of fifty-one pan-European credit exposures to utilities, infrastructure, and PPP/PFI loans. Boadilla, in turn, issued seven tranches of notes in an aggregate principal amount

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30 Standard & Poor’s, Case Study: Depfa’s Securitization of its PFI Loans, RATINGSDIRECT (Apr. 28, 2005).
31 Standard & Poor’s (Apr. 28, 2005), op. cit, at 6.
of approximately EUR 74 million ranging from AAA-rated to unrated. Notably, Banco Santander retained the super-senior risk on the reference portfolio. A schematic representation of the transaction appears as Figure 21.16.

C. Project Finance CBOs

The closing of the WISE 2006–1 transaction in 2006 marked the first project finance CDO based on project finance bonds rather than loans, making it the first project finance CBO. Specifically, WISE 2006–1 was based on exposure to thirty-one bonds, all of which were wrapped by monoline insurance companies rated AAA at the time. In the WISE 2006–1 structure, the WISE 2006–1 PLC SPE issued £63.75 million in three classes of floating-rate notes. The proceeds of the note issuance were invested in high-quality collateral to support the sale of protection to Dexia Crédit Local on a reference portfolio consisting of the thirty-one infrastructure bonds. The WISE 2006–1 transaction was referred to as a “double default” structure because investors were exposed to losses only if both the underlying project bond issuers defaulted and the monoline insurer(s) wrapping the bonds also defaulted.

In September 2008, the third EPIC transaction closed, with £58 million in notes collateralized by the sale of protection on 19 bonds issued by U.K. utilities or public

Figure 21.16  Boadilla Project Finance CLO (2008-1)
infrastructure entities. Like WISE 2006–1, the notes were wrapped by then-AAA-rated monoline insurers.

D. CDOs and the Credit Crisis

Most of the significant 2007 and 2008 losses occurred on structured credit products with exposures to subprime mortgages or mortgage-backed securities. Nevertheless, the entire CDO and CLO business has suffered from “guilt by association.” New issuance of both CDOs and CLOs plummeted in 2008, as investors fled the CDO market and widening credit spreads made the opportunity for yield arbitrage impossible as a practical matter.

The CDO structuring process is time-tested and conceptually sound. The notion that the risk of an asset portfolio can be allocated across different securities based on their depth of subordination is, after all, a basic tenet of corporate finance. Every time a corporation decides to issue subordinated debt (in lieu of senior debt), that security issuer makes a risk allocation decision that is fundamentally the same as the design principle underlying CDOs.

Nevertheless, the price of any security depends on both supply and demand considerations. At the date of this writing, the “uncertainty premium” that overhangs the CDO markets is still significant. New issues are slowly coming to market, but structured credit issuance remains well below levels observed in the years preceding the credit crisis. As long as the general repricing of risk and aversion to structured products vexes the market, the issuance of new CDOs and CLOs will likely remain significantly depressed.

VII. IMPLICATIONS OF THE MONOLINE DOWNGRADES

For the most part, the current credit crisis has affected project finance debt far less than other sectors of the global credit market. Project loan originations in 2008 were up relative to 2007, as compared to the contractions that occurred in many other loan markets (e.g., leveraged loans). As of November 2008, moreover, S&P rated 237 project finance transactions, of which 69 percent were investment-grade and 73 percent had stable outlooks. If anything, project finance may well have benefited from the credit crisis as investors seek to diversify into investments backed by collateral with relatively more stable and predictable cash flows and potentially superior recovery rates.

The credit crisis has certainly affected structured project financings in some adverse ways. In particular, external credit enhancements in structured project financings have often been provided by monoline financial guarantors. And as our discussion of the Clarksville Natural Gas Acquisition Corp. gas supply revenue bonds illustrated, the

32 Standard and Poor’s, Global Project Finance Ratings Remain Stable Despite Uncertain Credit Markets, RATINGSDIRECT (Nov. 3, 2008).
fortunes of structures that depend heavily on monoline guaranties have suffered along with the monolines themselves.

A monoline insurer is an insurance company that writes only one type of insurance—namely, credit or bond insurance. The monoline guaranty business began in 1971 when American Municipal Bond Assurance Corp. (Ambac) wrote the first bond insurance policy on a municipal obligation.33 MBIA entered the market soon thereafter, and both Ambac and MBIA dominated the municipal bond insurance business throughout the 1970s. Financial Guaranty Insurance Corp. (FGIC) was established in 1983 and began offering municipal bond insurance in 1984.34 In 1985, Financial Security Assurance (FSA) was established and became the first monoline to insure asset-backed securities. Ambac, FGIC, FSA, and MBIA—the so-called “Big Four” monolines—remained the largest U.S. financial guarantors through the 1980s, 1990s, and most of the 2000s.

Because one of the most important benefits to issuers from a financial guaranty is the enhanced credit rating, the ratings of the monolines have historically played an important role in the monoline business model. Until 2008, all of the Big Four monolines were rated AAA/Aaa/AAA.35 But that ended for most of the monolines in early 2008 as they began to announce their fourth quarter 2007 losses. With the exception of FSA, guaranties the monolines had provided on residential mortgage-backed securities and related asset-backed CDOs resulted in significant unrealized mark-to-market losses and credit impairments. Table 21.1 summarizes those losses for the Big Four monolines in the last half of 2007 and the first half of 2008. Not surprisingly, many of the monolines were downgraded, in some cases to well below investment-grade.

Apart from losses to date and downgrades, a potentially bigger threat for many of the monolines will be the difficulties the firms will face in attracting new business. Fitch Ratings noted: “While certain structured finance risks were the cause of the industry’s recent problems, structured finance has been a core source of revenues, profits and growth for the industry. With significant turmoil in many structured finance markets, and issuance in general at very low levels (year over year market-wide declines were between 80% to 90% in first quarter 2008), it is unclear to what extent structured finance will contribute as a source of revenue and profit for the financial guarantors.”36 Some have argued that the best hope for the monolines in the future is to return to their historical roots as municipal bond insurers. For example, Euromoney magazine observed that the postcrisis monolines “will likely be shadows of their former selves—retreating back to the municipal business they were founded to write.”37

35 Ratings shown in a X/Y/Z format indicate ratings assigned by S&P (X), Moody’s (Y), and Fitch (Z).
Table 21.1 Financial Guarantors’ Mark-to-Market Losses in 2007H2 and 2008Q1 ($ billions)

<table>
<thead>
<tr>
<th>Guarantor</th>
<th>Cumulative Impairment Charge</th>
<th>Cumulative Mark-to-Market Loss (excl. impairment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambac</td>
<td>1.8</td>
<td>5.8</td>
</tr>
<tr>
<td>FGIC</td>
<td>1.5</td>
<td>1.8</td>
</tr>
<tr>
<td>FSA</td>
<td>0.0</td>
<td>1.1</td>
</tr>
<tr>
<td>MBIA</td>
<td>1.0</td>
<td>6.3</td>
</tr>
</tbody>
</table>


All of these developments raise questions about the role that monolines will play in future structured project financings. Structures with large credit exposures to the monolines have already been affected. About 30 percent of the bonds backing the WISE 2006–1 project finance CDO notes, for example, were guaranteed by Ambac, FGIC, and Syncora Guarantee. In late November 2008, S&P downgraded those three monolines from A, CCC, and B, respectively, which resulted in downgrades of the senior WISE 2006–1 notes from AA- to BB and the WISE junior subordinated notes from BBB+ to B.

To the extent that some structured project finance transactions depend on financial guaranties for their marketability to investors, transaction volume could suffer as a result of the plight of the monolines. Nevertheless, several mitigating factors must also be kept in mind. First and foremost, the monolines are not all gone. Assured Guaranty (which now also owns FSA) and newcomer Berkshire Hathaway Assurance Co., for example, are currently rated relatively highly. So, some capacity remains in the monoline sector for guaranteeing high-quality structured project financings. There are reports, moreover, of additional possible monoline market entrants.

In addition, monolines are not the only providers of financial guaranties. Multi-line insurers and banks also still routinely provide guaranties as credit enhancements for bond issues. In fact, the once-core municipal guaranty business of the monolines has been largely replaced by bank-provided letters of credit in the last two years.

External credit enhancements, moreover, need not always be provided. Admittedly, the significant credit exposure associated with prepaids generally requires some form of external assurance. But for structured project financing vehicles like VPPs and CDOs, credit enhancement can be achieved within the structure itself. Withholding

38 Standard & Poor’s, Ratings Lowered on WISE 2006–1 PLC’s CDO Notes Following Monoline Downgrades, RATINGSDIRECT (Nov. 27, 2008).
39 Id.
41 See, e.g., Fitch Ratings, Financial Guarantors—Industry Outlook, FITCH RATINGS (July 17, 2008).
excess spreads payable to investors in subordinated tranches to fund credit reserves, for example, has long been a standard means by which the credit of senior CDO tranches can be enhanced vis-à-vis the more junior tranches.

Perhaps most importantly, credit enhancement is not necessary in all structured project finance transactions. The price of a security will, after all, reflect the credit risk of the security. As long as the underlying project itself is creditworthy, market participants routinely demonstrate a willingness to invest in structured project financings without any external enhancement at all.

VIII. CONCLUSION

The current credit crisis and the resulting dislocation in structured finance markets has (hopefully) only temporarily curtailed structured oil and gas project finance activity. As we have explained, structured finance has played an important and valuable role in facilitating the extension of credit to oil and gas transactions that may not have otherwise ever been completed. The use of derivatives to mitigate interest rate, exchange rate, or commodity price risk, moreover, is a valuable tool. So, too, are the uses of credit enhancements to reduce asset or contract counterparty risk in an economically efficient manner. These tools are far too valuable to be lost or to be left unused for long.

In particular, project finance CDOs remain a very promising and beneficial structured financing activity in oil and gas markets. In the wake of the current credit crisis, banks now have less capital and a more conservative risk appetite and, accordingly, are likely to be more reluctant to underwrite expensive projects without some confidence that the risks of those projects can be effectively managed. Project finance CDOs are an efficient means of facilitating risk transfer for banks. By bundling multiple project risks in a single portfolio whose risks are borne primarily by nonbank investors, project finance CDOs can facilitate extensions of project credit that might otherwise be impossible in the current market environment.

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