Determining Interest and Discount Rates Applicable to Secured Claims in the Specter of Bankruptcy Law

Aneel M. Pandey
Determining Interest and Discount Rates
Applicable to Secured Claims in the
Specter of Bankruptcy Law

ANEEL M. PANDEY*

INTRODUCTION ..................................................... 550
I. THE TIME VALUE OF MONEY ..................................................... 551
   A. The Emergence of Money ............................................... 551
   B. The U.S. Monetary System ............................................ 551
   C. The Incentive to Earn Money ....................................... 551
   D. The Real Interest Rate ............................................. 552
   E. Inflation ........................................................................... 552
   F. The Nominal Interest Rate .......................................... 553
   G. Present and Future Values .......................................... 554
   H. Perpetuities ................................................................... 556
   I. Annuities ......................................................................... 556
   J. Application to Section 1111(b) ....................................... 557
   K. Summary of the Time Value of Money ........................... 560

II. INTEREST DURING THE GAP PERIOD (POST-PETITION INTEREST) ......... 560
   A. Presumption Against Entitlement to Post-petition Interest .......... 560
   B. Cashing Out the Secured Creditor ................................... 561
   C. Post-petition Interest is Awarded if Debtor is Solvent ............. 561
   D. Oversecured Creditors are Entitled to Post-petition Interest ...... 562
   E. Equity Cushion Considerations ....................................... 564

III. POST-CONFIRMATION DISCOUNT RATES ..................................... 565
   A. Confirmation and Cram Down ........................................ 565
   B. Risk Premia and Probabilistic Models .............................. 567
   C. Determining the Appropriate Discount Rate ......................... 568
   D. Corporate Bond Ratings ............................................... 569
   E. Duration ......................................................................... 570
   F. Sample Corporate Bond Analysis ...................................... 571
   G. Diversifiable Risk ......................................................... 573
   H. Financial Liquidity Premia ............................................. 574
CONCLUSION ............................................................. 575
APPENDIX ........................................................................ 576

* A.B. 1988, Duke University; M.B.A. 1992, Owen Graduate School of Management, Vanderbilt University; J.D. 1992, Vanderbilt University; CEO, Transcender Corporation, Nashville, Tennessee. I would like to thank Robert K. Rasmussen, Margaret Howard, Ronald W. Masulis, and Theodore D. Sternberg for their helpful comments on an earlier draft of this Article.
INTRODUCTION

Due in part to overly-optimistic economic forecasts and questionable financial practices during the 1980s, many corporations are now caught under crushing debtloads that become increasingly difficult to service. For many of these debt-laden corporations, a bankruptcy reorganization is the only feasible survival alternative. As a result, the legal system, more specifically the U.S. Bankruptcy Code, will play an unprecedented role in the repair and restructuring of the American economy in the 1990s. As reorganizations are carried out under the Code and workouts take place in its shadow, the courts' interpretation of the Code could make the difference between stagnation and a stable capital structure for the economy. Fair treatment of equity holders is essential to preserve the going-concern value of businesses. Forthright treatment of creditors is needed so as not to fuel a credit crunch and its resultant economic stagnation. Furthermore, as the market for trading bankruptcy claims burgeons, investors will demand uniformity from the bankruptcy courts. Whereas the trend in the 1980s was to increase debt for tax and other reasons, the pendulum will swing back in the 1990s toward deleveraging. As investors trade claims in bankruptcy, risks will be shifted to those best able and most eager to bear them. To the extent that the markets for these securities are efficient, our net standard of living will be elevated.

Consistency from the courts in determining interest and discount rates will facilitate the financial restructuring of the economy. This Article formulates a basic framework to determine interest and discount rates applicable to secured claims in bankruptcy. Section I reviews the function of the interest rate from a macroeconomic perspective. The time-value-of-money concept explained in this section shows the later a cash flow comes in time, the less it is worth. Section II evaluates the treatment debtors and creditors receive during the gap period by examining how courts have struggled with the


3. The Gap Period is the time between the filing of the bankruptcy petition and the confirmation of the plan. HARVEY M. LEBOWITZ, BANKRUPTCY DESKBOOK 97 (2d ed. 1990).
Determined Interest and Discount Rates

SAN DIEGO LAW REVIEW

Code to award post-petition interest. Section III develops a method for determining the appropriate interest or discount rate applicable to a secured claim by referring to the corporate bond market.

I. THE TIME VALUE OF MONEY

A. The Emergence of Money

Before money came into use, people bartered their goods and services for the goods and services of others. As people sought to improve their standards of living, job specialization became necessary. The use of money arose as a practical alternative to barter. Money is a convenient storage device that facilitates the exchange of goods and services. A person earns money so that he may consume goods and services other than his own.

B. The U.S. Monetary System

The Federal Reserve Bank introduces money into society via loans to banks around the country. Money is created by an accounting entry on the Federal Reserve’s books and is loaned out to the banks. The Federal Reserve expects that value will be created in the economy through loans, and the value created will correspond to the interest charged on the loans. Money has value because only the Federal Reserve can introduce money, and it does so sparingly. Thus, money is scarce, and, like gold and diamonds, considered valuable. Although the Federal Reserve can introduce as much money as it desires, everyone has faith that it will not. Because the Federal Reserve is expected to be careful to keep the supply of money in line with the expansion of the economy, everyone agrees that money is scarce, and therefore, worth working for.4

C. The Incentive to Earn Money

The holder of money holds an obligation from everyone in the rest of the world to make him better off. Generally, a person obtains money by doing something to make someone else better off.5 In our society, a person cannot survive without money. Therefore, a person works now to incur obligations from everyone else. This allows him

---

4. On the other hand, many Latin American governments print up money wildly every time they get into a jam. Their money is no longer scarce, so no one values it, and it becomes worthless.
5. Of course there are exceptions: inheritance, gambling, etc.
to consume the goods and services of others later. Once a person obtains money, he must decide how to use it to maximize his welfare.

D. The Real Interest Rate

In the interest of their own survival, generally, people want to consume as many goods and services as they can as soon as possible. However, resources are limited, and not everyone can have everything at the present time. Some mechanism must therefore serve as a valve between consumption now and investment for later. Interest rates serve as this valve. Interest is the reward a person gets for putting off consumption. Societal preferences and market supply and demand forces determine the component of the interest rate known as the real interest rate.6

When a person has some money, he has a choice between spending it now or investing it for later. However, other people want to borrow his money to fund their own present consumption, and they are willing to offer him a reward for putting off consumption. This reward is referred to as the real interest rate and is in effect the “profit” a lender makes for putting off consumption. After money is borrowed, it can be used for present consumption (or use of resources). As people consume more and more in the present, money to fund this consumption becomes more scarce. As money becomes more scarce, a higher interest rate, or reward, is needed to induce people to lend their money to others. Therefore, people will consume until the interest rate has risen to a point where they feel the reward for investing for later is equal to the pleasure of consuming in the present. The current interest rate is therefore a reflection of the trade-off people are making between consumption now and investment for the future. This reward, or real interest rate, is just one of the two components that determines the nominal risk-free interest rate.7

E. Inflation

Inflation, in addition to the real interest rate, is built into the nominal risk-free interest rate. The nominal risk-free rate, \( r_p \), is equal to

---

6. During the 1980s, U.S. interest rates had been generally higher than Japanese interest rates because, inter alia, the Japanese, as a matter of culture, preferred to save more than Americans. Therefore, less of an incentive (a lower real interest rate) was needed to entice them into putting off their consumption until later.

7. The nominal rate is also known as the current, quoted, or stated rate. See Black’s Law Dictionary 1049 (6th ed. 1990) (defining nominal interest rate as “[t]he rate of interest stated in a security as opposed to the actual interest yield that is based upon the price at which the interest-bearing property is purchased and the length of time to maturity of the obligation”).
the real rate, \( r_R \), plus the expected inflation rate.\(^8\)

When people consume now instead of later, the demand for goods and services increases. As this demand increases, goods and services become scarcer. The providers of the goods and services then realize they can charge more for their products, so prices rise. As prices rise, inflation\(^9\) occurs. If a person knows that a year from now a dollar is going to buy less because of inflation, he will want to consume now in order to get the most for his money. To offset this, even more of a reward must be given to prevent the person from choosing to consume now. Thus, the current interest rate must reflect not only the real interest rate, but also the expected inflation rate.

**F. The Nominal Interest Rate**

The nominal risk-free interest rate compensates a person for investing for the future instead of consuming now. A person can invest in government securities and be sure to receive interest cash flows at the nominal risk-free rate. The nominal interest rate is simply the market's best estimate of how much compensation is required to induce a person to invest for later. When a person decides to lock in his money at a specified rate for a long period of time, he could win big if interest rates fall the day after he invests. He will have secured an obligation to receive a big reward when everyone else must settle for less of a reward, and he can sell the rights to the relatively larger reward.\(^10\)

The interest rate can be higher on some investments than on others because, unlike government securities, loans to private entities are not risk-free. For example, the borrower might default, and then the lender would not receive any reward. If the investment is not risk-free, a risk premium rate must then be added to the interest rate to compensate the lender for assuming this default risk. Assessing the appropriate risk premium is addressed in Section III.

---

8. This is an approximation. Actually, a one dollar security has an expected real rate of interest, \( r_f \), where \( r_f = r_R + \text{inflation} + r_F \text{inflation} \). The cross product, \( r_F \text{inflation} \), is assumed to be insignificant because it is so small. Furthermore, the nominal risk-free rate, \( r_f \), does in fact include a premium to offset the risk associated with inflation.

9. See *Webster's Third New International Dictionary* 1159 (1986) (defining inflation as "an increase in the volume of money and credit relative to available goods resulting in a substantial and continuing rise in the general price level"); see also *Black's Law Dictionary* 779 (6th ed. 1990) (defining inflation as "[a]n overall rise in prices which results in a decline in the real value of the dollar").

10. This explains why bond prices fall when interest rates go up and rise when interest rates go down. A bond may be sold at any time to another investor, regardless of maturity, if the holder wants to realize the gain or loss on the bond price.
The point of this discussion is that the interest rate determines the equilibrium point at which people are just as happy to borrow to receive the pleasure of consuming in the present or to lend to receive the reward for investing for later. If the interest rate is lower than this equilibrium point, people will consume until the interest rate rises to this equilibrium point, and vice versa if the interest rate is too high. Therefore, the interest rate reflects the point where people are in general equally happy to be either borrowing or lending money according to their consumption and investment preferences. Thus, on average, people should be indifferent toward either spending money now or receiving the interest rate reward for postponing consumption. For example, if the interest rate is 10% per year, a person should be just as happy with $1 today as he is with $1.10 a year from now ($1 + 10% of $1). Thus, the future value one year from now of having $1 today is $1.10. By the same principle, a person should have no preference between receiving 91¢ today and $1 a year from now since 91¢ plus 10% (9¢) equals $1. So if a person knows he is going to receive $1 a year from now, and the interest rate is 10%, that $1 has a present value of 91¢. The important point here is that if a person accepts the interest rate as equal to 10% per year, there is absolutely no difference between having $1 today and $1.10 a year from now. For this reason the interest rate could more accurately be called the “indifference rate.”

G. Present and Future Values

If $1 is invested today at 10%, in one year it would grow to $1.10, and in two years to $1.21 (not $1.20). This result occurs because the interest is compounded, that is, the 10¢ interest earned after the first year will earn 1¢ interest for itself during the second year. The “miracle” of compound interest is that the interest keeps earning interest. For example, the present value of $1 that will be received two years from now would be 83¢ (assuming a 10% interest rate). This is because 83¢ invested today would earn interest of 8¢ after the first year, and that 8¢ of earned interest would earn an additional 1¢ of interest in the second year. Therefore, the total in year two is $1. As indicated in Figure 1, the future value two years from now of 83¢ today is 83¢ times one plus the interest rate for a total of 91¢ after year one and a total of 91¢ times one plus the interest rate for a total of $1 at the end of year two.

---

1. Interest rates and discount rates refer to the same rate. At an annual interest rate of 10%, $10 will earn $1 of interest in one year. [$10 \times (1 + .1) = $11]. Conversely, a discount rate of 10% is used to find that $11 a year from now is worth $10 today. [$11 \div (1 + .1) = $10]. In the context of bonds and notes, this rate is referred to as the “yield,” whereas in the context of capital budgeting it is referred to as the “capitalization rate.”
If $C$ is the nominal cash flow received, $PV$ is the present value, $r$ is the interest rate and $n$ is the number of years or periods later that the cash flow is received, then:\(^{12}\)

$$PV = \frac{C}{(1 + r)^n}.$$  

In other words, the present value of a stream of cash flows is equal to the sum of the discounted flows or

$$PV = \sum_{i=1}^{n} \frac{C_i}{(1 + r)^i}. \quad ^{13}$$

For example, suppose the nominal interest rate is 10%,\(^ {14}\) and four cash flows will be received: $60 at the end of the first, second and third six-month periods, and $1,060 at the end of the second year. Here, $C_{i=1}$, $C_{i=2}$, and $C_{i=3}$ equal $60 and $C_{i=4} = 1,060$. Using the equation above, the present value of these flows equals:

$$\frac{$60}{(1 + .05)^1} + \frac{$60}{(1 + .05)^2} + \frac{$60}{(1 + .05)^3} + \frac{$1060}{(1 + .05)^4} \text{ or }$1,035.\]


\(^{13}\) The summation notation, $\sum$, is read as “the sum of the following terms of $i=1$ to $n$.”

\(^{14}\) The per-period rate is equal to the nominal interest rate, $r$, divided by the number of periods per year. The nominal interest rate is almost always quoted as a per-year rate despite compounding. With payments every six months, the effective interest rate per year, $r_e$, is 10.25%, $[r_e = (1+.10/2)^2-1]$. If interest is compounded continuously (once every moment), the effective interest rate per year is 10.52%, $[r_e = \exp(rt)-1, r_e=\exp(.1)-1 \text{ where } \exp(x) = e^x=2.718^x]$. 555
H. Perpetuities

The above analysis shows today's value of a series of cash flows coming in the future. But what is the value today of a series of cash flows continuing forever? Imagine a person has $1 that he decides he will never spend, but he will spend the 10% interest that it earns each year. At the end of each year, he will receive a cash flow of $0.10, spend it, and then still have the same $1 left over to do the same thing the next year. Theoretically, he could do this for a hundred or even an infinite number of years. The $0.10 cash flow that he receives each year forever is called a perpetuity. By our previous interest rate analysis, a person agreeing that the interest rate is 10% should be equally happy to receive either $1 today or $0.10 every year forever.

The notable concept here is that a level stream of payments extending forever into time must be pictured as exactly the same as a single flow equal to the first flow, $C$, divided by the interest rate, $r$. Therefore, we represent the present value of a perpetuity as

$$PV_{perpetuity} = \frac{C}{r} \text{ alternatively, } C = r \times PV_{perpetuity}$$

Using this formula, a person who will receive $0.10 every year forever can find the value of these flows by dividing $0.10 by 0.1 (or dividing $0.10 by 10%) to come up with a present value of $1. That is, since $1 could generate $0.10 per year forever at 10% interest, $0.10 per year forever must be worth $1.

I. Annuities

Imagine that a debtor is buying an office, and the interest rate that he and the creditor agree upon is 10%. Suppose the office is worth $100,000 if he pays cash today, but he wishes to make equal yearly payments on it over thirty years. The debtor and creditor must then ask: What yearly flow of cash over the next thirty years would be the equivalent of $100,000 paid today, knowing that the interest rate is 10%? If the creditor says this amount equals $10,608 per year for thirty years, the debtor can check this figure using the above equations.

If the debtor instead agreed to pay the creditor $10,608 every year in perpetuity, the office would be worth $106,080 because $10,608 divided by 10% is $106,080. In other words, if the creditor had $106,080 today he could invest it at 10% and get back $10,608 each year forever. However, the office costs $100,000 not $106,080, and

15. A perpetuity is a level stream of payments occurring for an unlimited period of time. See also WEBSTERS, supra note 9, at 1685 (defining perpetuity as "[a]n annuity payable indefinitely").

556
the debtor will not make payments in perpetuity but will make his last payment at the end of year thirty.

Consider instead that the debtor will in fact have to make a $10,608 payment every year forever, but also that after year thirty the creditor starts paying the debtor $10,608 per year in perpetuity so that in effect the payments after year thirty cancel out. This would allow the debtor to subtract today's value of the perpetuity he will receive from the creditor thirty years from now from the value of the perpetuity he is going to start to pay today, and he will know the value of the stream of his thirty payments.

At the end of year thirty, the value of the $10,608 per year perpetuity that the creditor is going to start paying the debtor will be $106,080. So at the end of year thirty, the debtor will be receiving $106,080. To determine how much that $106,080 thirty years from now is worth today, use the present value formula above. This formula shows:

\[
PV = \frac{C}{(1 + r)^n} = \frac{\$106,080}{(1 + .1)^{30}} = \$6,080.
\]

Therefore, the value of the office must be $106,080 minus $6,080, or $100,000. From this we see:

\[
PV = \frac{C}{r} - \left( \frac{C}{r} \times \frac{1}{(1 + r)^n} \right)
\]

Rearranging this equation algebraically gives us the present value of an annuity:

\[
PV_{\text{annuity}} = \frac{C}{r} \left( 1 - \frac{1}{(1+r)^n} \right).
\]

\[
J. \ Application to Section 1111(b)
\]

A creditor's total claim in bankruptcy is bifurcated into secured and unsecured claims. Section 1111(b) gives an undersecured creditor the option of electing to receive the present value of his secured claim paid over a period of time that would allow the face

16. Id. at 88 (defining annuity as "[a]n amount payable yearly, at regular intervals (such as quarterly), or for a certain or uncertain period (such as for years, for life, or in perpetuity)"); see also BLACK'S LAW DICTIONARY 90 (6th ed. 1990) (defining annuity as "[a] fixed sum payable to a person at specified intervals for a specified period of time or for life").
amounts of the payments to equal the amount of the creditor's unsecured and secured claims. Section 1111(b) was enacted in an attempt to avoid the result in In re Pine Gate Associates, Ltd. In Pine Gate, the creditors had loaned the debtor funds to build condominiums on a nonrecourse basis. In the middle of construction the debtor reorganized, and the court limited the creditor's total claim to the value of the unfinished buildings. This deprived the creditors of the increased value the buildings would have had upon their completion.

Upon electing section 1111(b) treatment, the creditor receives the present value of the secured portion of his total claim via deferred cash payments. The nominal dollar amounts the deferred cash payments total is equal to the amount of the total claim. The creditor's total claim is deemed "secured." Even though the creditor is no better off if the reorganization succeeds, since he is still only receiving the present value of his secured claim, if the plan fails post-confirmation, he has recourse against the debtor-in-possession for the total claim. Thus, if the creditor is not confident in the debtor's prospects to reorganize successfully, the section 1111(b) election could prove to be a wise choice. Under section 1111(b) in the Pine Gate situation, the creditor would have been no better off if the reorganization were successful; however, if the reorganization plan failed, he could have enforced his total claim against the completed

   (b)(1)(A) A claim secured by a lien on property of the estate shall be allowed or disallowed under section 502 of this title the same as if the holder of such claim had recourse against the debtor on account of such claim, whether or not such holder has such recourse, unless—
   (i) the class of which such claim is a part elects, by at least two-thirds in amount and more than half in number of allowed claims of such class, application of paragraph (2) of this subsection; or
   (ii) such holder that does not have such recourse and such property is sold under section 363 of this title or is to be sold under the plan.
   (B) A class of claims may not elect application of paragraph (2) of this subsection if—
   (i) the interest on account of such claims of the holders of such claims in such property is of inconsequential value; or
   (ii) the holder of a claim of such class has recourse against the debtor on account of such claim and such property is sold under section 363 of this title or is to be sold under the plan.


21. The nominal dollar amount that the deferred cash payments total is of no economic significance. That is, the time value of these flows must be considered before these payments can be valued.

Using the above formulas, the cash flows provided under section 1111(b) election can be calculated. Suppose a creditor has a claim for $250,000, of which only $100,000 is secured by collateral. Section III discusses determination of the interest rate, so for this example assume that the appropriate risk-adjusted rate is 10% per year. Also assume that the payments are made monthly, which implies that \( r \) equals \( \frac{1}{12} \) or \( 0.00833 \) (0.833%) per month. The face value of the payments must equal $250,000. Assume that the cash payments, \( C \), will be made monthly for \( n \) months. We then know that:

\[
C \times n = \$250,000 \quad \text{alternatively,} \quad C = \frac{\$250,000}{n}.
\]

We also know that the present value of the cash flows for \( n \) months must equal the amount of the secured claim:

\[
\$100,000 = \frac{C}{0.00833} \times \left( 1 - \frac{1}{(1 + 0.00833)^n} \right).
\]

Substituting \( \$250,000/n \) for \( C \), we have:

\[
\$100,000 = \frac{\$250,000}{(n \times 0.00833)} \times \left( 1 - \frac{1}{(1 + 0.00833)^n} \right).
\]

We can then find \( n \) that satisfies the above equation\(^{23}\) by numerical methods.\(^{24}\) Here we find that \( n \) equals 267 months (22.25 years). This yields a monthly payment of \( \$250,000/267 \), or \( \$936 \).

In *H&M Parmely Farms v. Farmers Home Administration*,\(^{25}\) the creditors made a similar section 1111(b) election. Under the plan of reorganization in *Parmely*, the creditor retained its mortgage on its entire claim of \( \$241,741 \) and was to receive its secured claim of \( \$131,755 \) with interest of 5% per year in thirty-two annual payments of \( \$8,337 \).

---

\(^{23}\) Actually, \( n \) is the minimum number of periods over which the claim can be repaid. Unless this were the case, a creditor with a total claim of \( \$100,001 \) could force full immediate payment if the secured portion were \( \$100,001 \). Likewise, a creditor should be permitted to waive a portion of the total claim so that the repayment period is not inordinately long.

\(^{24}\) For example, in Lotus 1-2-3 for Windows, enter \( (250000/(0.00833\times{A3}))(1-(1/(1 + 0.00833)^A3)) \) in cell A1 and 100000 in cell A2. Click Tools, click Backsolver. When prompted for Make Cell, enter A1; when prompted for Equal To Value, enter A2; when prompted for By Changing Cell, enter A3. Click Solve. The solution for \( n \) will then appear in cell A3.

K. Summary of the Time Value of Money

Money is valuable because it is scarce. It secures an obligation from everyone else to make its holder better off. One usually cannot obtain money unless he makes someone else better off or at least promises to do so.

A cash flow received in the future is worth less than the same cash flow received today. The amount that the future cash flow must be discounted is proportional to the interest rate. The interest rate is determined by supply and demand forces in the market. Interest rates regulate the trade-offs people must make to consume now rather than in the future. The interest rate is set by the collective wisdom of the market based on the expected economic conditions and the risk associated with the expected cash flows. Anyone who could consistently make better estimates than the market as to the “true” interest rate could make millions on Wall Street.

As shown above, the interest rate is a key concept in borrowing and lending. When a court supersedes market mechanisms to award interest, the time value of money must be considered.

II. Interest During the Gap Period (Post-petition Interest)

A. Presumption Against Entitlement to Post-petition Interest

As a general rule, a creditor is not entitled to post-petition interest according to section 502(b)(2). The Supreme Court’s decision in Vanston Bondholders Protective Committee v. Green underlies section 502(b)(2). In Vanston, the Court stated that in order to preserve the estate for a pro-rata distribution, no creditor should be able to gain an advantage by collecting interest over the gap period because the delay in payment is imposed by operation of law. Notwithstanding the exception in subsection II C., infra, undersecured and unsecured creditors may not receive compensation for the opportunity cost or time value of their claims, even under an adequate protection theory. In United Savings Ass’n of Texas v. Timbers of

26. 11 U.S.C. § 502(b)(2) provides:
   (b) Except as provided in subsections (e)(2), (f), (g), (h) and (i) of this section, if such objection to a claim is made, the court, after notice and a hearing, shall determine the amount of such claim in lawful currency of the United States as of the date of the filing of the petition, and shall allow such claim in such amount, except to the extent that —
   (2) such claim is for unmatured interest . . .

Id.

27. 329 U.S. 156 (1946).

Inwood Forest Associates, Ltd., the Supreme Court ruled that an undersecured creditor is not entitled to compensation via adequate protection for the delay it experiences in foreclosing on the collateral.

B. Cashing Out the Secured Creditor

Withstanding the exceptions discussed infra, the debtor may cash out the secured creditor and leave him unimpaired under sections 1124(3) and 1126(f). These sections, combined with section 502(b), allow the debtor to avoid paying post-petition interest to the unimpaired secured creditor. In spite of the general rule against post-petition interest, the Code makes exceptions where the debtor is solvent or the creditor is oversecured.

C. Post-petition Interest is Awarded if Debtor is Solvent

By combining section 1129(a)(7), which says that a creditor must receive at least as much as he would in a Chapter 7 liquidation, with section 726(a)(5), a creditor will receive post-petition interest at the legal rate in the unlikely event that the debtor is solvent; that is, there are funds left over after the distributions to other claimants. Some courts interpret the legal rate as referring to the state judgment rate while others interpret the legal rate as referring to the federal judgment rate.

29. 484 U.S. 365 (1988); but see In re American Mariner Indus., Inc., 734 F.2d 426 (9th Cir. 1984) (essentially overruled by Timbers).
D. Oversecured Creditors are Entitled to Post-petition Interest

In In re Sun Valley Ranches, Inc., the court reasoned that since an oversecured creditor has an equity cushion, he would be overcompensated if he were to receive opportunity cost payments. This reasoning is flawed because such a result would deprive the oversecured creditor of his pre-confirmation opportunity costs. The better view is expressed in In re Lippy, wherein the court stated,

The property is worth approximately five times the amount of Land Bank's lien... there is no imminent danger that Land Bank could be placed in a partially unsecured position. Land Bank's claim is secure; the time value of its position is not... Land Bank is entitled to protection of its lost reinvestment opportunity cost.

Most courts agree that by the language of the Code, under section 506(b), a secured creditor is entitled to post-petition interest to the extent that he is oversecured. Post-petition interest is awarded only up to the value of the collateral. In other words, once post-petition interest has been awarded to the point that the creditor is no longer oversecured, the creditor is no longer entitled to post-petition interest under section 506(b). Post-petition interest is paid out of the equity cushion and is treated as part of the secured claim.

The Supreme Court has interpreted that due to the placement of the commas in section 506(b), the phrase "interest on such claim" is separate and divorced from "provided for in the agreement under which such claim arose." That is, the oversecured creditor is entitled to some rate of interest, but not necessarily the rate provided for in the agreement. Thus, the contract rate is irrelevant. Because

---

37. Id. at 527; see also In re Embrey, 56 B.R. 626, 628-29 (Bankr. W.D. Mo. 1986); In re Orlando, 53 B.R. 245, 249 (Bankr. W.D. Mo. 1985).
38. 11 U.S.C. § 506(b) (1988) provides:
(b) To the extent that an allowed secured claim is secured by property the value of which, after any recovery under subsection (c) of this section, is greater than the amount of such claim, there shall be allowed to the holder of such claim, interest on such claim, and any reasonable fees, costs, or charges provided for under the agreement under which such claim arose.
Id.
42. United States v. Ron Pair Enters., Inc., 489 U.S. 235, 241-42 (1989) (this interpretation was used to decide the narrow issue that a nonconsensual secured creditor, i.e., a creditor that became so when there was "no agreement under which such claim arose," was entitled to post-petition interest).
courts have had no guidance in determining this critical rate, the treatment received by litigants has been inconsistent and unpredictable. In *In re Laymon*, the court used the 52-week Treasury-bill rate to calculate post-petition interest under section 506(b). The *Laymon* court reasoned that the legal rate required under section 726(a)(5) should be carried over into section 506(b). The court further reasoned that awarding a rate higher than the legal rate would be unfair to other creditors who were not a party to the original contract.

However, using the federal judgment rate does not compensate the creditor for the risks he incurs due to the debtor's use of his capital. As Section I indicates, the interest rate has three components: the real rate, expected inflation, and the risk premium. In an efficient market, creditors will not lend unless the transaction makes them no worse off than if they invested their money elsewhere. The Treasury-bill rate is equal to the real rate plus expected inflation. It does not include a risk premium because Treasury bills are risk-free. If worse comes to worse, the Treasury will print more money to satisfy its obligations to the holders. This may have inflationary ramifications, but the holder is always assured of receiving the dollar amounts due him. In a bankruptcy setting, the creditor's claim is far from risk-free. The creditor entails the risk that the debtor will disperse what is left of the firm's assets resulting in reduced or no payments on the claim. Lenders and borrowers carefully assess the risks inherent in each loan, and arrive at a risk premium to be added to the risk-free rate to offset the risk inherent in the loan. That is, the more likely it is that the creditor will lose some or all of his money, the higher the risk premium must be to entice him into entering the transaction. The risk premium is an essential component of the interest rate, and it must compensate the creditor for taking on the risk of the loan. After a bankruptcy filing, a creditor generally faces even more risk than he did when he entered the contract. To award anything less than a risk-adjusted rate deprived the creditor of the risk premium that is inherent in the interest rate provided for in section 506(b). If

---

45. In this case, the court assumed that the legal rate was equal to the federal judgment rate rather than the state judgment rate.
47. 117 B.R. at 863.
a creditor expects Chapter 11 to strip him of his risk premium, then he would have to raise his interest rates and collateral requirements to offset the "bankruptcy risk." Even if favoring bankrupts by spreading this risk among all borrowers in the market might make sense from a policy standpoint, inefficiencies result to the extent that treatment of creditors is inconsistent. To the extent creditors can predict what they will receive in a bankruptcy proceeding, they will be able to charge rates that accurately reflect the risks they are bearing.

Notwithstanding *Ron Pair*, some courts have awarded post-petition interest at the contract rate. Other courts have taken different approaches. In *In re Laza*, the court held that instead of the contract rate, a reasonable post-petition rate approved on a case-by-case basis should be used. Thus, the court used a rate of 8%, based on the current money-market opportunities, to award section 506(b) post-petition interest on the oversecured creditor's second mortgage.

In *In re Elmwood Farm, Inc.*, the court awarded the oversecured creditor section 506(b) interest at 15%, the post-default penalty rate provided in the mortgage notes. Courts have also rejected using a "late-charge" post-default rate, opting instead to use the New York statutory rate (9%) to award section 506(b) interest where the claim had been reduced to a judgment. The *Lehal* court stated that using a post-default penalty rate would not be appropriate where a judgment had been entered. Where the claim arises from a nonconsensual obligation, e.g., taxes, courts have deferred to rates established by the statute creating the claim. Courts have also chosen rates based on equitable principles.

### E. Equity Cushion Considerations

Rather than allow a bankruptcy court to fashion an interest rate, the parties may negotiate a new rate after the bankruptcy filing. In other words, if both parties agree that interest is due and wish to

---

51. Id.
56. Id. at 589.
avoid litigation, they may simply agree upon a rate. Of course, they will have to negotiate within certain bounds so as not to draw objections from other creditors. This may be a very wise choice for the secured creditor if his equity cushion is thin. Once the equity cushion is exhausted, no additional post-petition interest is payable, no matter what rate is used. The equity cushion also may deteriorate due to attorney's fees,\textsuperscript{59} costs, and charges, as long as these items were provided for in the original security agreement.\textsuperscript{60} Assuming the equity cushion is 15\% and a federal judgment rate of 6\% is used, the equity cushion will be exhausted in a gap period\textsuperscript{61} of less than two and one-half years.\textsuperscript{62} Negotiating for a higher rate would be unproductive since at a higher rate the equity cushion would be exhausted earlier, after which no interest would accrue. A secured creditor should consider this before engaging in costly litigation to secure a higher rate.

III. POST-CONFIRMATION DISCOUNT RATES

A. Confirmation and Cram Down

Absent federal code provisions, state law governs the disposition of a creditor's security upon default.\textsuperscript{63} However, the Code provides for an orderly disposition of the debtor's assets upon the filing of a bankruptcy petition.\textsuperscript{64} Often, a business is worth more as going concern

\textsuperscript{59} Under § 506(b), if provided for in the security agreement, attorney's fees must be awarded even if such an award is contrary to state law. Unsecured Creditor's Comm. v. Walter E. Heller & Co. Southeast, Inc., 768 F.2d 580, 582 (4th Cir. 1985). However, the attorney's fees must be reasonable. \textit{In re Wonder Corp. of Am.}, 72 B.R. 580, 589 (Bankr. D. Conn. 1987) (discusses elements of reasonableness).

\textsuperscript{60} 11 U.S.C. § 506(b) (1988).

\textsuperscript{61} One study of 37 cases showed an average gap period of 2.5 years, with a range from 8 months to over 8 years and a standard deviation of 1.4 years. Lawrence A. Weiss, \textit{The Bankruptcy Code and Violations of Absolute Priority}, in 4 \textit{The Continental Bank J. of Applied Corp. Fin.} 71 (Summer 1991).

\textsuperscript{62} If no interim payments are made and interest is compounded monthly, the equity cushion lasts 28 months (2\% years). \[(1.06/12)^n=1.15; n=ln 1.15/ln 1.005; n=28 \text{ months.}\] The equity cushion would be exhausted in exactly two and one-half years if no interim payments are made and compounding of interest is not allowed. The compounding of interest has been allowed where state law would have permitted it. \textit{See In re Sublett}, 895 F.2d 1381, 1385 (11th Cir. 1990). However, the Supreme Court, in a somewhat dated opinion, has declined to compound interest. \textit{See Vanston Bondholders Protective Comm. v. Green}, 329 U.S. 156 (1946). Such an approach is unsatisfactory because if compounding of interest is not allowed, the creditor is forced to reinvest money earned as interest in the debtor and receive a return on this money of 0\%.


\textsuperscript{64} \textit{See generally Thomas H. Jackson, The Logic and Limits of Bankruptcy Law} (1986).
than if it isliquidated piecemeal. Chapter 11 seeks to preserve this going-concern value. If the debtor complies with Chapter 11 of the Code, he may continue to operate the business as a debtor-in-possession to preserve jobs for his employees and suppliers, as well as draw salaries for himself and friends and relatives on the board of directors.

The debtor has the exclusive right to file a plan to reorganize the business for the first 120 days after the order for relief is granted. The plan must classify the claims against the debtor and specify the treatment of each class of claims. Usually, each secured claim is placed alone in a separate class. To be confirmed, the plan must comply with the requirements of section 1129(a). Section 1129(a)(8) requires that all classes of creditors either be left unimpaired or, if impaired, have accepted the plan. However, even if section 1129(a)(8) is not met, the court may still confirm the plan under the cram down provisions of section 1129(b) if the plan does not unfairly discriminate against any dissenting impaired class of creditors, and the plan is fair and equitable to such class. A plan is fair and equitable to a secured creditor if (1) the secured claimant retains a lien on the assets and receives deferred cash payments that have a present value, as of the effective date of the plan, of at least

---


67. Id. § 1121(b).

68. Id. § 1123(a).


70. Section 1129(a) requires that (1) the plan complies with Code provisions, (2) the proponent of the plan complies with Code provisions, for example, disclosure, (3) the plan is made in good faith, (4) payment for services or expenses related to the plan are approved by the court as reasonable, (5) the officers, directors and insiders of the "new" company are disclosed, (6) any rate change, if the entity is regulated by a governmental commission, is approved by such commission, (7) the "best interests of creditors test" is met, (8) all impaired classes accept the plan (notwithstanding cram down), (9) at least one impaired class of creditors accepts the plan, (10) administrative expenses and involuntary gap claims are provided for, (11) unsecured pre-petition third, fourth, fifth and sixth priority claims are provided for, (12) unsecured pre-petition seventh priority tax claims are provided for, (13) the plan is feasible in that there is a reasonable chance of success for the reorganized company and that it is unlikely liquidation or further reorganization will be needed, (14) bankruptcy fees are provided for, and (15) retiree insurance benefits are protected. 11 U.S.C. § 1129(a) (1988).

71. A class is deemed impaired unless the plan (1) does not alter the legal, equitable or contractual rights of the claimant, or (2) (i) cures any default, and (ii) reinstates the original maturity date of the obligation, and (iii) pays for any damages caused by the claimant's reliance on the contract provisions, and (iv) does not otherwise alter the claimant's rights, or (3) cashes out the claimant. Id. § 1124.


73. The term "at least" seems to imply Congressional intent that a court err, if it must, on the side of a higher discount rate.
the value of the collateral, or (2) the secured party receives the indubitable equivalent of his secured claim, or (3) the collateral is sold and a lien attaches to the proceeds. The remainder of this section focuses on the discount rate to be used to determine the present value of deferred cash flows under alternative (1).

B. Risk Premia and Probabilistic Models

If the lender thinks that there are three chances in one hundred that the borrower will default, he could add 3% to the interest rate to compensate himself for assuming the risk that the debtor will default. For example, suppose a lender has $1000 and makes one hundred loans of $10, each payable an hour later. An hour later the lender will expect payments of $10.30 ($10 plus 3% of $10) on each loan for a total of $1030. But 3% of these loans, or $30 worth, will end in default. Therefore, the lender will break even only if he charges the 3% risk premium, or $.30 to each loan. If the lender thinks there is a 3% chance of default per year, he could add 3% to the nominal risk-free rate to break even.

However, determining the probability of default could be extremely difficult and time-consuming. Even if the probability of default were known, we would still not know how the market is collectively pricing risk. Probability theory does not account for utilitarian preferences with respect to taking risks; if economic conditions

74. The present value of the deferred payments equals the value of the collateral, which is determined by an appraisal of the collateral.

75. See In re Sun Country Dev., Inc., 764 F.2d 406 (5th Cir. 1985); In re Murel Holding Corp., 75 F.2d 941 (2d Cir. 1935).

76. 11 U.S.C. § 1129(b)(2)(A) provides:

(i)(I) that the holders of such claims retain the liens securing such claims, whether the property subject to such liens is retained by the debtor or transferred to another entity, to the extent of the allowed amount of such claims; and (II) that each holder of a claim of such class receive on account of such claim deferred cash payments totaling at least the allowed amount of such claim, of a value, as of the effective date of the plan, of at least the value of such holder's interest in the estate's interest in such property;

(ii) for the sale, subject to section 363(k) of this title, of any property that is subject to the liens securing such claims, free and clear of such liens, with such liens to attach to the proceeds of such sale, and the treatment of such liens on proceeds under clause (i) or (iii) of this subparagraph; or

(iii) for the realization by such holders of the indubitable equivalent of such claims.

Id.

77. Here, an hour is used to eliminate the effects of the real rate and inflation. Very little inflation will occur, and a very small reward will be needed during such a small time span.
are unfavorable, the market may be collectively risk averse to lending. In such a case, risk would be priced differently than probability theory alone would predict. Therefore, the court must refer to the market to price this risk correctly.

C. Determining the Appropriate Discount Rate

Some courts have chosen to use the contract rate as the discount rate used in applying section 1129(b)(2)(A)(i). If interest rates have fallen since the contract date, businesses might have an incentive to use bankruptcy as a refinancing tool. However, this concern is probably unjustified because the costs of a bankruptcy reorganization would most likely exceed the benefits of refinancing. A more compelling argument against the contract rate is the fresh-start directive embodied in the Code as well as the equitable powers given to the court. The original contract rate should no longer apply because the risks probably have changed since the negotiation of the original agreement, and the new obligation is with an entity now considered different from the original debtor since the debtor-in-possession is considered to be a new entity after reorganization.

Courts and commentators have also urged use of the yields on risk-free Treasury obligations. However, this approach violates the Code because using a risk-free rate on a non-risk-free obligation will not give the creditor the present value of the deferred cash flows as mandated by section 1129(b)(2)(A)(i).

The preferable view, as well as the trend, is to use the current market rate of interest. Using a current market rate captures the

79. See Weiss, supra note 61, at 72 (professional and administrative fees associated with bankruptcy filings averaged 20% of the market value of equity where the market value of equity was ascertained one year prior to filing).
80. See, e.g., In re Mohawk Indus., Inc., 82 B.R. 174, 177 (Bankr. D. Mass. 1987) (the right of a debtor to a fresh start makes it sufficiently distinct from its former self so as to prevent the required mutuality for setoff of pre-petition debts owed by the debtor against post-petition debts owed to the debtor). See also In re Virginia Block Co., 16 B.R. 771, 774-75 (Bankr. W.D. Va. 1982); In re Shoppers Paradise, Inc., 8 B.R. 271 (Bankr. S.D. N.Y. 1980).
84. In re Camino Real Landscape Maintenance Contractors, Inc., 818 F.2d 1503 (9th Cir. 1987); In re Southern States Motor Inns, Inc., 709 F.2d 647, 651 (11th Cir. 1984).
price of risk through heavily-analyzed capital markets. Since debt instruments carrying the same risk are fungible, the current market rate for a section 1129(b)(2)(A)(i) obligation will be equal to the yield on a corporate bond with matching characteristics. In addition to advocating use of the current market rate, Collier on Bankruptcy\(^{85}\) defines the market rate best:

\[T\]he rate of interest charged in a particular market is affected by supply of funds, present demand for funds, amount to be borrowed, duration of the borrowing and credit risk. The range of prevailing interest rates can be ascertained by comparing at any point in time the following: prime rate, \ldots federal funds, \ldots discount rate, \ldots call money, \ldots commercial paper, \ldots certificates of deposit, \ldots treasury bills.\(^{86}\)

These instruments given by Collier,\(^{87}\) however, are short-term instruments\(^{88}\) and carry zero or very little risk. Obligations with higher credit risk and longer terms can be priced by comparison with instruments traded in the corporate bond markets. Discount rates (or yields) can be obtained through frequently published, readily available sources. Yields on corporate bonds accurately reflect the present supply and demand for funds, adjusted for riskiness. Credit risk can be referenced by comparing bond rating descriptions prepared by Moody's Investors Service or Standard & Poor's Corporation. Matching the durations of the section 1129(b)(2)(A) obligation and the selected corporate bond is a critical issue that can only be solved mathematically.

\textbf{D. Corporate Bond Ratings}

The court must consider the riskiness of deferred cash flows by examining the characteristics of the obligation. Moody's Investors Service evaluates debt obligations of hundreds of corporations and briefly describes these obligations.\(^{89}\) The court must find the Moody's

\begin{footnotesize}
\footnotesize


6. \textit{Id.} at 1129-83 n.45 (emphasis added).

7. \textit{Id.} at 1129-84.

8. Short-term Instruments are generally instruments maturing in one year or less.


\end{footnotesize}
rating that best describes the characteristics of the section 1129(b)(2)(A) obligation. This is done using the descriptions in the Appendix, *infra*. Most section 1129(b)(2)(A) obligations would not be below a "B" rating since they are fully secured at the time of confirmation.

E. Duration

Duration is an adjusted measure of an obligation's maturity. Unlike maturity, duration accounts for the magnitude of flows at the time they come due.90 Because the present value of far-in-the-future cash flows is more sensitive to interest rate changes, duration is also a measure of an obligation's sensitivity to future changes in the appropriate risk-adjusted interest rate. By making sure that the duration and credit risk of the section 1129(b)(2)(A) obligation and the duration and credit risk of the corporate bond are about the same, the economic character of the section 1129(b)(2)(A) obligation will most accurately match that of the corporate bond. At such point, using the yield to maturity of the corporate bond is appropriate for discounting section 1129(b)(2)(A) deferred cash flows. Duration calculations are critical when short and long-term rates differ greatly; that is, when the yield curve91 is steep.

Duration relates how a percentage increase or decrease in interest rates results in a change in the present value of the obligation and can be expressed as follows:92

\[ D = -\frac{\text{% change in } PV}{\text{% change in } r} \]

For example, for all obligations having a duration, \( D \), of three years, a one-percent increase in interest rates will lead to a three-percent decrease in present value.93

Duration is computed by summing the contributions that the cash flows make to the total present value, after weighing the cash flows coming later in time more heavily.94 Later cash flows must be

90. It follows that the maturity and duration of an obligation are equal if the obligation involves only one payment.

91. A yield curve is a graphical plot of bond yields versus time to maturity. If long-term and short-term interest rates are equal, the yield curve is flat. If long-term rates are higher than short-term rates, the yield curve is upward sloping.

92. This is an approximation. Actually, \( D = -\frac{dPV}{PV}\left[\frac{dr}{r}(1 + r)\right] \) where \( PV \) is the obligation's present value, \( r \) is its yield, and \( d \) is read "an infinitesimal change in."

93. It follows that if the rate set by the court on an obligation with a duration of twelve years is one percentage point lower than the appropriate risk-adjusted rate, the secured creditor will be undercompensated by 12% of the value of his claim.

94. Frederick Macaulay, *Some Theoretical Problems Suggested by the Movements of Interest Rate, Bond Yields, and Stock Prices in the United States Since 1856,*
weighted more heavily because time compounds the effect of interest rate changes.

Duration is computed as:

\[ D = \sum_{i=1}^{n} \frac{i \times (C_i / (1 + r)^i)}{PV} \]

Suppose the nominal interest rate is 10% and four cash flows will be received: $60 at the end of the first, second, and third six-month periods and $1,060 at the end the second year. The duration of these flows is 3.68 half-years, or 1.84 years:

\[ D = \frac{1 \times (60 / (1 + .05)^1)}{1035} + \frac{2 \times (60 / (1 + .05)^2)}{1035} + \frac{3 \times (60 / (1 + .05)^3)}{1035} + \frac{4 \times (1060 / (1 + .05)^4)}{1035} \]

If the obligation's payments are equal, the closed-form, short-cut equation for an annuity can be used:

\[ D = \frac{1 + r}{r} - \frac{1 + r}{r(1 + r)^n} \]

**F. Sample Corporate Bond Analysis**

After coming up with a credit rating for the section 1129(b)(2)(A) obligation by using the rating guide in the Appendix, a person then finds a pool of traded corporate bonds with the same rating. One then must compute the duration for each bond in the pool until a bond with a duration roughly equivalent to the section 1129(b)(2)(A) obligation is found. For example, assume that the deferred cash flows of the section 1129(b)(2)(A) obligation have a duration of six years and a credit risk comparable to that of a corporate bond with a rating of “Baa2.” Looking through Moody’s Bond Record shows that Boise Cascade Corporation, an Idaho-based paper-products manufacturer, has a bond issue outstanding with a rating of Baa2.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Moody's Rating</th>
<th>Interest Dates</th>
<th>Current Call Price</th>
<th>Yield to Maturity</th>
<th>Yield&lt;sup&gt;98&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boise Cascade Corporation</td>
<td>Baa2</td>
<td>J &amp; D N.C.</td>
<td>N.C.&lt;sup&gt;103&lt;/sup&gt;</td>
<td>8.80</td>
<td>9.85</td>
</tr>
</tbody>
</table>

Figure 2: Moody's Bond Issue Analysis

The duration of this bond is found by determining the duration of the stream of payments it makes. The number after “nts.” under “Issue”, in Figure 2 above, states the coupon or interest payment rate as a percentage, which can never change. One half of 9.85%, or 4.93% of the face value of the bond, is paid every June 15 and December 15, with the last interest payment and payment of the face value on June 15, 2002, the expiration date. Assuming that the note has a face value of $1000<sup>104</sup> and that today is January 1, 1992, interest of $49 will be paid every June 15 and December 15 with the last interest payment and principal of $1000 being paid at expiration. A short cut to the summation formula above for a coupon bond is the closed-form equation:

\[
D = \frac{1 + r}{r} - \frac{(1 + r) + n(c - r)}{c[(1 + r)^n - 1] + r},
\]

where \(c\) is the coupon rate per period. This bond will make twenty interest payments of $49 followed by a $1049 payment on June 15, 2002 for a total of \(n = 21\) six-month periods. We use the yield to maturity for \(r\); do not use the number in the “yield” column if it is different from the coupon rate in the “Issue” column. Here,

\[
D = \frac{1 + .088}{.088} \cdot \frac{(1 + .088) + 21 (.0493 - .088)}{.0493 [(1 + .088)^{21} - 1] + .088} = 11.5 \text{ periods},
\]
or about six years.

The bond should be noncallable (N.C.) because callable bonds include a right by the debtor to pay off the obligation early. Unless the

---

98. “Yield” refers to the yield to maturity at the time the bond was issued, which is now irrelevant.
99. Notes: generally refers to bonds with maturities of 10 years or less.
100. Coupon Rate.
101. Year of Maturity.
102. Payments are made semi-annually, with the last payment coming during the underlined month of the year of expiration.
103. Not callable: the borrower may not pay off the obligation before expiration.
104. Most corporate bonds have a face value of $1000; however, knowing the face amount of the bond is not necessary to calculate its duration.
debtor is given this option, a noncallable bond should be chosen. If the section 1129(b)(2)(A) obligation and the bond have a similar credit rating and close durations, the bond's yield to maturity, here 8.80%, should be used to compute the present value of the section 1129(b)(2)(A) obligation's deferred cash flows.

G. Diversifiable Risk

Risk is the likelihood that a lender will receive a bad surprise, for example, a default. Risk is characterized by the volatility of the obligation's payoff. Volatility is quantified by the amount the actual cash flows are expected to deviate from the expected cash flows. For example, imagine a gambling game in which a person flips a coin and wins $1 if it comes up heads but has to pay $1 if it comes up tails. After one hundred trials, a person could expect to be about even. However, suppose a person wins $100,000 if the coin comes up heads but has to pay $100,000 if it comes up tails. The second game is riskier because at the end of one hundred trials in the second game the chance that a person will have lost the equivalent of his house is greater. Both games have the same expected return, zero, but the dollar returns in the second game are more volatile. The more volatile the returns on an obligation are, the more compensation is required by its holder to bear the risk.

One portion of the total risk, called systematic risk, affects the whole market and cannot be eliminated by investing in a broad range of securities. This risk could come from the general economy, the business cycle or changing exchange rates. Another portion of the total risk, diversifiable risk, is firm or industry specific. For example, a large fall in oil prices might cause Exxon stock to go down but General Motors stock to go up. Such oil-price risk can be eliminated by holding both stocks. A person's expected return, where he does not know how oil prices will move, will be the same, but the portfolio consisting of these two stocks will be less volatile, thus less risky. Therefore, the diversifiable risk is eliminated because the gain on the General Motors stock will offset the loss on the Exxon stock.

Risk premia do not include compensation for diversifiable risk because the market has no reason to reward one for taking on risk that can be diversified away. If a claim holder cannot hold other securities which diversify away the diversifiable risk associated with the

105. This assumes that demand for automobiles goes up if they become more affordable because of lower fuel prices.
obligation, he is best off to sell the obligation to a person who can.

H. Financial Liquidity Premia

Financial liquidity premia\textsuperscript{106} compensate the lender to the extent the trading of the security is inhibited and the security cannot easily be sold for cash. If a lender feels he will have difficulty trading in the obligation for cash, he will demand a higher interest rate to offset this difficulty. If the valuation of the creditor's underlying collateral is inaccurate, a creditor may find that his asking price to trade away the obligation is too high. This makes determining the present value of the underlying collateral critical.

Unfortunately, the present value of an asset or debt obligation is unobservable until after its own sale transaction takes place. For example, suppose a consumer purchases a $25,000 new automobile and then decides to sell it. Assuming the dealer's profit was $2000, the dealer will not buy it back unless the consumer takes a $2000 loss. Here, the dealer is quoting a bid/ask spread of $23,000/$25,000. He will sell the car for $25,000 and buy it back for $23,000, thereby charging the consumer $2000 to cover his costs and profits. The consumer may still value the automobile close to his purchase price, but by the time the consumer spends time and money locating another buyer, he could end up with transaction costs amounting to $2000. The more difficult an asset or security is to trade, the wider its bid/ask spread will be. However, until a transaction actually takes place, the value of an asset or security can only be estimated.

Financial liquidity premia compensate lenders for the transaction costs they might incur if they trade their securities. Some of these premia have been quantified in highly-efficient, heavily-traded markets.\textsuperscript{107} It can be argued the lender should simply wait out the term of the obligation and not be compensated for his inability to sell the security for cash. However, if creditors must put these securities out to compete with more liquid securities, they will suffer a loss due to the lower liquidity. A court may offset this loss by valuing the collateral at a price closer to the collateral's asking price than its bid price, rather than by attempting to build a solution into the discount rate. Until studies are done on financial liquidity premia for a broader range of assets, courts should consider liquidity in this light.

\begin{itemize}
\item \textit{Economic liquidity premia express investors’ preferences for short-term securities over long-term securities and are reflected in the current market rates on all securities. Financial liquidity premia, however, are specific to the characteristics of individual obligations.}
\item \textit{Yakov Amihud & Haim Mendelson, \textit{Liquidity, Maturity, and the Yields on U.S. Treasury Securities}, 46 J. of Fin. 1411 (1991) (in this study, the yield on Treasury notes and Treasury bills with the same maturities and risk-free payoffs differed by .428\% due solely to the fact that the Treasury bills were more liquid).}
\end{itemize}
when doing collateral appraisals. In either case, creditors will always have an incentive to make these markets more efficient to increase the value of their claims through higher liquidity.

CONCLUSION

Interest rates define the terms of intertemporal trade. In applying sections 506(b), 1111(b) and 1129(b)(2)(A), the court supplants the market mechanisms normally governing transactions. Although the Code does not establish a procedure to reset the interest rate terms of the contract, a rate should be used that reflects the risk and duration of the obligation. Thus, when either the post-petition interest rate or post-confirmation discount rate is set, the current market rate should be used.

Although the landscape of Chapter 11 differs from that outside bankruptcy, capital markets can provide information that will yield an appropriate market rate for the obligation that accounts for the obligation's risk and duration. By consistent use of the appropriate risk-adjusted rate, courts will eliminate economic inefficiencies that would result otherwise. This article describes how courts have wrestled with this high-dollar-impact issue, and proposes a way to interpret the rates generated in the capital markets for use in applying sections 506(b), 1111(b), and 1129(b)(2)(A).

While the debtor-in-possession is under the supervision of the court during the gap period, post-petition interest should be paid to an oversecured creditor. The rate to award section 506(b) interest should be based on the expected date of confirmation. This can be done using bonds with short durations as calculated in Section III, supra. Near confirmation, the calculation should be redone to reflect the appropriate discount rate and comply with sections 1111(b) or 1129(b)(2)(A).

As more bankruptcy claims are traded, courts will obtain feedback on their discount-rate decisions. By evaluating how the obligations' remaining payments are recapitalized by traders, courts can adjust their pricing of risk to mirror market mechanisms.

APPENDIX

Key to Moody's Corporate Ratings*

Aaa

Bonds which are rated Aaa are judged to be of the best quality. They carry the smallest degree of investment risk and are generally referred to as “gilt edge.” Interest payments are protected by a large or by an exceptionally stable margin and principal is secure. While the various protective elements are likely to change, such changes as can be visualized are most unlikely to impair the fundamentally strong position of such issues.

Aa

Bonds which are rated Aa are judged to be of high quality by all standards. Together with the Aaa group they comprise what are generally known as high grade bonds. They are rated lower than the best bonds because margins of protection may not be as large as in Aaa securities or fluctuation of protective elements may be of greater amplitude or there may be other elements present which make the long-term risks appear somewhat larger than in Aaa securities.

A

Bonds which are rated A possess many favorable investment attributes and are to be considered as upper medium grade obligations. Factors giving security to principal and interest are considered adequate but elements may be present which suggest a susceptibility to impairment sometime in the future.

Baa

Bonds which are rated Baa are considered as medium grade obligations, i.e., they are neither highly protected nor poorly secured. Interest payments and principal security appear adequate for the present but certain protective elements may be lacking or may characteristically unreliable over any great length of time. Such bonds lack outstanding investment characteristics and in fact have speculative characteristics as well.

* Moody's Bond Record, supra note 89, at 3.
Bonds which are rated Ba are judged to have speculative elements; their future cannot be considered as well assured. Often the protection of interest and principal payments may be very moderate and thereby not well safeguarded during other good and bad times over the future. Uncertainty of position characterizes bonds in this class.

B

Bonds which are rated B generally lack characteristics of the desirable investment. Assurance of interest and principal payments or of maintenance of other terms of the contract over any long period of time may be small.

Caa

Bonds which are rated Caa are of poor standing. Such issues may be in default or there may be present elements of danger with respect to principal or interest.

Ca

Bonds which are rated Ca represent obligations which are speculative in a high degree. Such issues are often in default or have other marked shortcomings.

C

Bonds which are rated C are the lowest rated class of bonds and issues so rated can be regarded as having extremely poor prospects of ever attaining any real investment standing.

Note: Moody's applies numerical modifiers, 1, 2 and 3 in each generic rating classification from Aa through B in its corporate bond rating system. The modifier 1 indicates that the security ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates that the issue ranks in the lower end of its generic rating category.

Interest dates and date of month of maturity are given. The underlined letter denotes the month of maturity:

- J & J . . . January and July
- F & A . . . February and August
- M & S . . . March and September
- A & O . . . April and October
- M & N . . . May and November
- J & D . . . June and December

577