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SPECIAL REPORT

PRINCIPAL PROTECTED NOTES:

HOW, WHY AND WHEN?

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This report sheds some light on the little understood and burgeoning principal protected note industry in Canada including an in depth look at the two basic guarantee structures, the fees and a simulation of returns under one guarantee structure.

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The notes are actually bonds with an attached variable coupon payment, and there is no necessary correlation between the coupon and the underlying investment.

The return is often constrained in a variety of ways thereby instituting a cap on returns over the life of the investment

General Parameters

The principal-protected note (also “linked” or “deposit” note) is essentially a debt security issued by an agent (investment manager) and backed up by a guarantor (bank). The note guarantees 100 percent of the principal invested if held to maturity (the term generally ranges 6 to 8 years, somewhat shorter than a segregated product). Instead of coupon payments, the pay-off at maturity is the original principal plus any appreciation derived from the underlying asset which is typically a mutual fund or group of funds, an index or some arbitrary basket of equities, increasingly pools of income trusts; but often assets inaccessible or too risky for investors, including hedge funds, fund of funds, emerging-markets (especially China), currencies and commodities.

Equivalently, these notes can be viewed as bonds with variable coupons (varying from 0 percent to some maximum); in some performance calculations, the formula does indeed behave like a variable coupon. Crucially, there is no necessary correlation between the value of this notional variable coupon and the actual returns of the underlying assets.

The variable coupon can be constrained in a variety of ways, thereby instituting a cap on annualized returns of, say, 8 to 10 percent. The obvious way is to embed the cap explicitly in the calculation formula; the so-called “lock-in” formula is a variation on this theme. Similarly, “Callability” is the other important strategy: the bank reserves the right, on specific dates (typically either yearly or half-way through the term), to enforce an early redemption at a specific annualized rate (presumably to stem a run-away liability in exceptional circumstances).

The performance calculations can be quite complex. As Keith Damsell, columnist at the Globe and Mail, comments, “The complex and subtle nature of structured products make investing a potential minefield. Reading the fine print is essential.” Unfortunately, there is no legal requirement for a prospectus with set format and clauses; adequate disclosure is therefore a constant and nagging issue. However, the legalese is standard across the offering memoranda; variation is related to complexity of the underlying investments and capital guarantees.

The investment breaks down into two parts: the guarantee and the underlying investment.

The guarantee is achieved with a zero coupon bond which calls for upwards of 70 percent of investors' capital at the outset.

Therefore only 30 percent of capital is available for the underlying investment.

Leverage exposure to the underlying investment is achieved with a call option.

100-Percent Guarantee Structures

There are really only two basic methods of ensuring 100 percent of the original investment at maturity. These guarantees differ in terms of participation in, and exposure to, the underlying assets, as well as costs, risks and volatility.

The strategy should be obvious from the OM. Dynamic hedging (CPPI below) requires several pages of documentation to explain; additional charges for interest expenses are telltale. It is reasonable to assume a plain-vanilla strategy as a default, in the absence of this additional baggage, but caveat emptor.

Plain-vanilla (Zero Coupon with Options)

Many commentators have pointed out that the standard or “plain-vanilla” strategy is something any reasonably sophisticated investor could employ on their own when investing in most liquid securities. The guarantee is the economic equivalent of a zero-coupon bond or STRIP; about 65 to 70 percent of capital is allocated to the debt securities to mature at 100 percent of initial capital at end of the desired term. The underlying investment is the economic equivalent of a long-term option on the underlying asset(s) whereby the remaining 30 to 35 percent of proceeds is used to write embedded call options to enhance pay-out at maturity. Thus investors can speculate while preserving their capital. The goal is to maintain 100 percent exposure to the underlying investment throughout the full term, implying roughly three times leveraging of the 30 to 35 percent of active capital at the outset.

With this strategy, the guarantor, heretofore a schedule I or schedule II bank, agrees to pay the investor in the note a return equal to the return of the underlying investment after fees. To achieve this result, the guarantor typically writes an out-of-the-money call option on the underlying investment to guarantee exposure to it. The strike price of the option is greater than the price of the underlying investment basket at the time of issue because the guarantor is on the hook for performance only after fees. Hence an out-of-the-money call option is employed.

While all this goes on under the hood of the notes, the investor has only three main concerns in regards to the guarantee.

1. The financial solvency of the guarantor.
2. The level of participation in the underlying investment.
3. The cost of the guarantee

The typical guarantor is a well-capitalized schedule I or schedule II bank. The solvency of schedule I and schedule II banks, that have been issuing notes, is so strong it is hardly worth mentioning. In this case, it appears that while the financial solvency of the guarantor is a very important matter for investors to consider, there appears to be little to no risk of default on these notes given the creditworthiness of these banks.

Interest rates dictate the cost of the guarantee. The lower is the rate of interest, the higher is the cost of the guarantee.

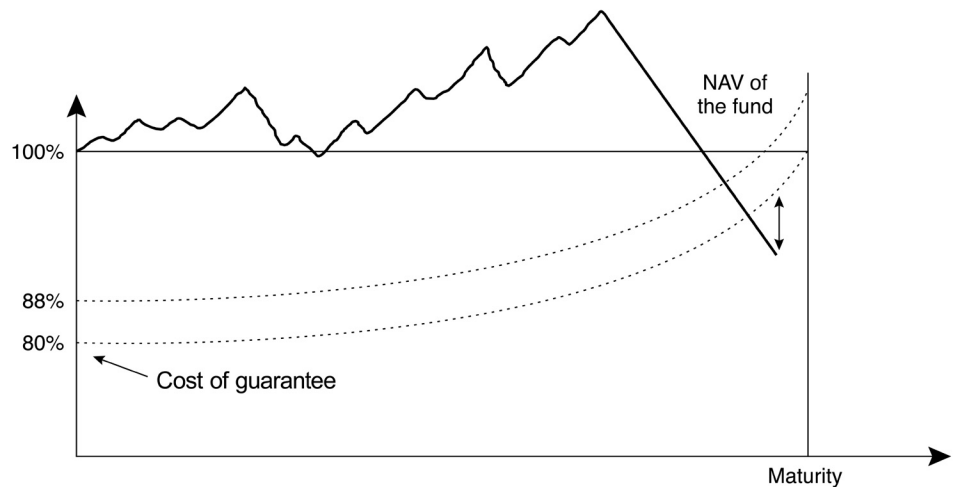
Interest rates determine in part the level of participation in the underlying investment. Rates also dictate the cost of the guarantee, and are also a factor in the cost of the option which in turn is determined by the level of volatility of the underlying investment basket.

The cost of the guarantee moves in opposite direction to the yield on a zero-coupon bond. As bond yields fall, the guarantor must pledge more capital toward the guarantee in order to ensure 100 percent of the investment at maturity.

A zero-coupon bond is a fixed income instrument that, as the name indicates, pays no coupons over the life of the investment. Rather, the capital value of the bond increases over the life of the bond paying a terminal value of, say, \$100 at maturity. The higher the yield on the bond at the time of issue, the greater is the discount price below \$100 at that time.

Using recent history as our example, the low interest rate environment has required guarantors to allocate more capital toward the guarantee to ensure return of capital at maturity. As much as 70 percent of capital must initially be set aside given the typical eight year time horizon for the guarantee. Therefore, only 30 percent of capital is effectively available for investment in the underlying investment—be it hedge funds, income trusts, etc.

Chart: As the rate of interest falls, the initial cost of the guarantee rises in this case from 80 to 88 percent of capital.



The more volatile the underlying investment, the higher is the cost of the option used to gain access to the investment.

So, lower yields in recent years mean that less capital is available to put toward the underlying investment basket which is achieved through a call option. With less money for the option, the guarantor may not be able to purchase an option with full notional exposure to the underlying investment. As a result, the participation rate in the investment basket may be less than 100 percent or, similarly, returns are capped at a certain level.

Directly related to the issue of participation is the cost of the option itself. The more volatile the underlying investment, the higher is the cost of the option since options are priced directly off the volatility of the underlying investment basket. Also, the options are generally priced based on expected volatility which is greater than actual historical volatility for the underlying investment as a margin of safety for the guarantor: in this regard,

The NAV of the investment will fluctuate with the price of the zero-coupon bond especially early on in the life of the note.

CPPI requires no leverage though it does allow for leverage to boost returns when the investment is performing well.

The CPPI strategy has no cost associated to the option strategy.

The CPPI strategy also allows for 100 percent exposure to the investment at the outset.

investors are essentially overpaying for the option. Unless the actual volatility of the investment turns out to exceed the volatility implied by the price of the option, investors are paying a premium on this strategy typically running 50 to 70 basis points over the alternative CPPI (given the risks of CPPI, many deem this premium more than acceptable).

Consider, then, a simple scenario. The investor wants long-term exposure to the volatile XYZ Index without fear of risking the principal. The investor buys an XYZ-linked note at \$100 per unit; the note has a five-year term and offers 100 percent of the index's appreciation. At the time of purchase, the index is at 1000; in five years, the index is up 60 percent to 1600. The investor will have earned \$160 per note: the original \$100 plus an additional \$60 per note (60 percent * \$100). However, the risk is that the index falls below 1000; in that case, the return is 0 percent (or \$100 per note).

Finally, one further point with regard to the guarantee: it is the "deep discount" nature of the zero-coupon bonds that exposes the plain-vanilla strategy to interest rate volatility during the life of the investment. Of course, that risk is not an issue for investors who hold the note, which implies holding the bond, to maturity.

Constant-Proportion Portfolio Insurance (CPPI)

The more complicated structure is known as CPPI. The benefit of the CPPI is that there is no required leveraging at the outset, and initially investors gain 100 percent exposure to the underlying investment. Furthermore, this strategy does not have an extra cost associated with the purchase of the option. There are also two components here, the underlying investment and the guarantee which is also notionally related to a zero-coupon bond.

The CPPI strategy allows for the application of leverage if the underlying investment is experiencing strong returns and calls for deleveraging of the active investment if it shows a loss. At any rate, the investor is compensated with a return of capital less fees at a minimum in the event of losses on the underlying investment.

In the case of poor performance on the investment, at any time during the life of the note, a basic formula dictates the percentage of assets that are moved from the investment into the zero-coupon bond; any improvement of performance for the underlying investment calls for the movement of money back into the underlying investment basket: hence, "dynamic leveraging".

The basic asset-allocation calculation is based on a zero-coupon bond returning 100 percent of the initial investment upon maturity. Let us take as a concrete example the formula supplied for Open Sky Capital's "MBI [Montrusco Bolton Investments] Balance Portfolio Principal Protected Notes".

Initially 100 percent of proceeds are invested in the underlying investment which is a basket of mutual funds. In the event of weak returns, some portion of that capital is pulled from the underlying investment and is assigned to the guarantee, the zero coupon bond, according to their formula; if the losses are reversed, investment is moved back into the mutual fund basket.

If performance on the underlying investment is weak, capital is pulled out of the investment and allocated toward the guarantee.

The floor represents the cost of the guarantee during the life of the investment.

Deleveraging of the active investment reduces the potential return of the note.

Chart: The cost of the guarantee rises throughout the life of the investment.

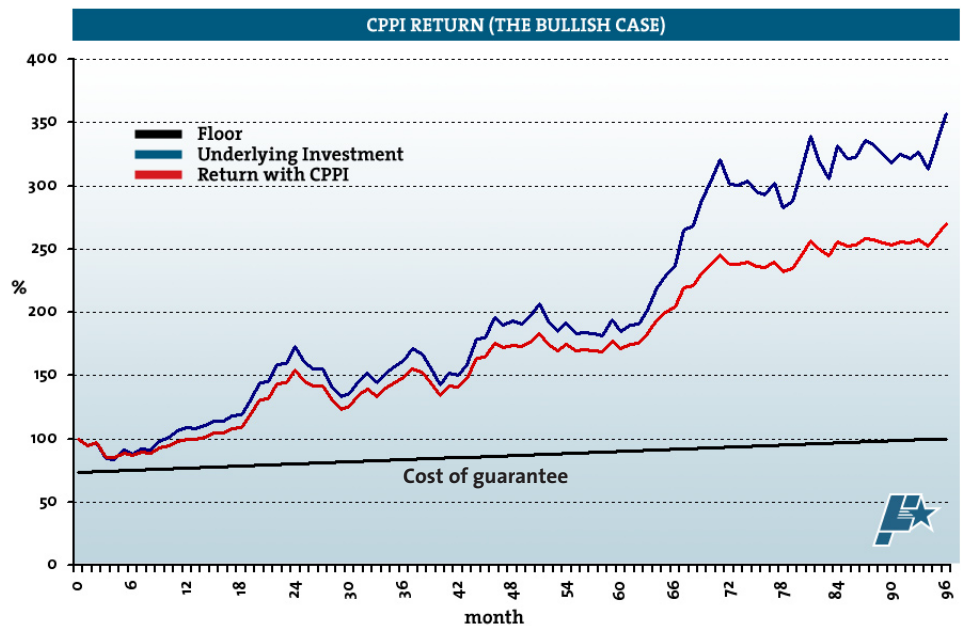
The strategy is designed to make the entire capital active from the onset and to only remove capital from the underlying investment if it has not appreciated well in excess of the cost of the guarantee. So if performance is poor, capital is reallocated to the bond investment – an effective deleveraging of the underlying investment. The investment is structured so there is usually enough capital to afford buying the guarantee throughout the life of the investment.

The calculation “floor” is the notional cost of the guarantee, i.e., the zero-coupon rate used to monitor NAV. The cost of the zero coupon bond at the time of issue is \$73.50 at the time of issue and is calculated from the current yield on a zero coupon bond.

The current yield applied in this particular case is 3.3125 percent compounded annually which equals 26.5 percent over the eight year period (=1.033125 power 8). Thus the implied floor is 73.5 at the outset and increases steadily at 3.3125 percent each year until reaching 100 at maturity. The floor increases because as time elapses, the zero-coupon bond increases in value until maturity. So it becomes increasingly more expensive to purchase the capital guarantee.

The difference of $100 - 73.5 = 26.5$, then, is the critical cut-off for the calculation. Since all the money is initially in the underlying investment, so long as the value of that capital exceeds the cost of the guarantee (the cost of buying the zero-coupon bond) by more than 26.5 percent, all the money remains in the underlying investment.

However, if the value of the underlying investment falls below that critical level, money is pulled out of the underlying investment and is channeled toward the zero-coupon bond (the guarantee). This creates a deleveraging of the active capital to ensure that there is sufficient capital available to purchase the guarantee if need be.



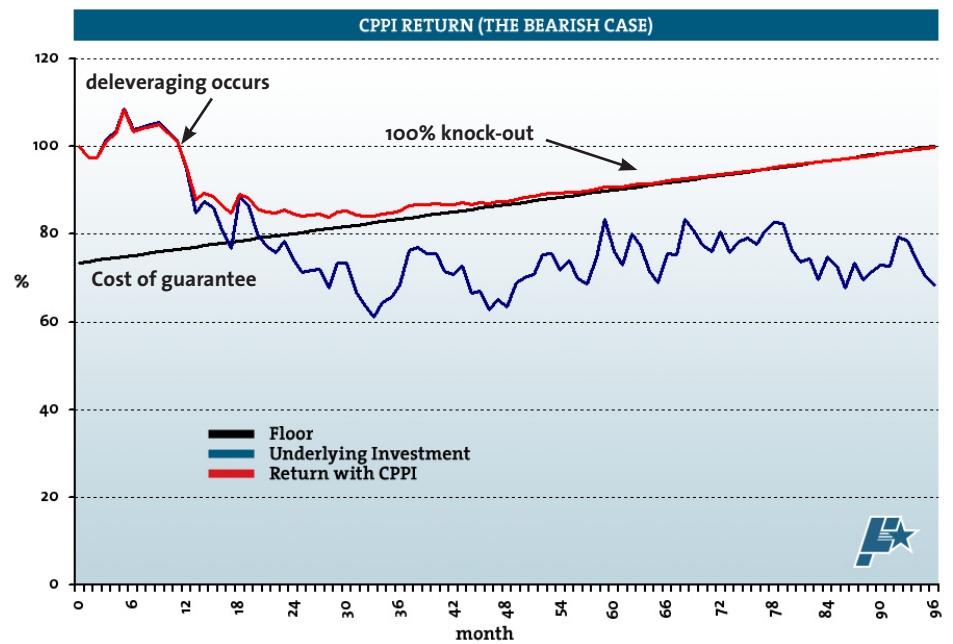
On the other hand, if the active capital has performed well so there is a sizeable gap or amount of capital between the value of the underlying investment and the cost of the

In a bullish scenario, leverage is added to boost returns of the note.

guarantee, then leverage is added to the investment implying an assignment of extra capital to the underlying investment through bank borrowing. However, in this bullish scenario, the leverage has been capped at 125 percent as stipulated in the offering memorandum. In this case, then, only 25 percent of NAV is borrowed from the bank, and 125 percent is assigned to the funds. (Read the fine print: this maximum is critical, and can range as high as 250 percent.)

Finally, if the value of the underlying investment falls below the cost of buying the guarantee (the floor), all the money is channeled toward the guarantee, effectively locking in the bonds for the balance of the term, with 0 percent participation in the underlying investment. This is the so-called “knock-out” scenario. For example, consider a scenario with a steep decline in returns followed by strong returns for the underlying investment; in this case the knocked-out investor completely misses out on all gains.

Chart:
If the value of the underlying investment falls below the cost of buying the guarantee, all the money is pulled out of the active investment.



In passing, there is sometimes provision for the fourth scenario: initially bullish, but turning bearish late in the term. The note may provide for a “lock-in” of some percentage of the highest NAV attained. This may be stated as a fixed percentage of NAV or as part of another complex formula.

In the case study, we simulate returns under a CPPI strategy.

We choose the Fund Library Balanced Fund Average to simulate returns under an actual CPPI structure.

The average return under the CPPI structure is lower than the average return without the CPPI.

Understanding CPPI Under Various Return Scenarios

Understanding how the CPPI works in theory is a different matter from understanding how it would work in a real market environment. Only by simulating different return scenarios under a given CPPI strategy will advisors better understand the cost and benefit of the guarantee.

So we have taken one sample portfolio, the Open Sky Capital MBI [Montrusco Bolton Investments] Balance Portfolio Principal Protected Notes, as a test case, and simulated the basic trading strategy under different market returns to give advisors a better understanding of what they might expect investing in a CPPI note structure.

The MBI Balanced Note has as the underlying investment a basket of Montrusco Bolton mutual funds giving investors broad exposure to capital markets while protecting capital. Allocation to the basket of mutual funds is described in the offering memorandum as follows:

FUNDS	LOWER LIMIT	UPPER LIMIT
Montrusco Bolton Bond Total Return Fund	30%	50%
Montrusco Bolton Canadian Equity Fund 1	0%	20%
Montrusco Bolton Canadian Small Capitalization Equity Fund	20%	30%
TSX 100 Momentum Fund	10%	10%
Montrusco Bolton U.S. Equity Fund	5%	20%
Montrusco Bolton E.A.F.E. Equity Fund	5%	10%

It is impossible to simulate returns using the actual underlying investment basket as outlined in the OM because there is insufficient history for all the funds. For example, the MBI Total Return Bond Fund was only started in January 2005. So we have chosen to use the Fund Library Balanced Fund Average as a proxy for the MBI investment basket. In so doing, we are assuming a similar return and risk profile for the average balanced fund and the MBI investment basket listed above. While returns may differ in real life, this proxy return provides a reasonable risk/return profile for consideration.

Using a repeated sampling method, we generate 500 different possible returns for the underlying investment under two possible scenarios: one using the CPPI methodology and one without. The results are listed below:

FUND LIBRARY BALANCED FUND AVERAGE	MIN	MEAN	MAX
Total Return With CPPI / Trading Level	105.85	169.11	267.39
Total Return Without CPPI / Trading Level	96.75	177.94	344.12

There is almost no possibility of loss on average in Canadian balanced funds using return simulation, so the need for a guarantee structure is questionable.

The possibility of losses after eight years in the S&P/TSX Composite using return simulation is positive, so the use of a CPPI structure is relevant.

On average, investors are giving up several percentage points of returns under the CPPI structure before accounting for fees.

Using the return distribution for the Fund Library Balanced Fund Average, the mean total return without the CPPI is 7 percentage points higher than the mean total return with the CPPI. Note that this result is calculated before fees, and that returns would be several percentage points lower after fees are deducted from returns. This simulation is designed to show the average cost to returns before fees from using a CPPI strategy.

More telling is the minimum and maximum return under the two different strategies. The minimum return under the CPPI is a 5.8 percent gain before fees. In this case, the guarantor would be fully covered for the capital guarantee.

But the worst possible return with the straight investment strategy is only slightly negative. That is, there is almost no incidence of loss over the eight year time horizon for the average balanced mutual fund under return simulation. In other words, the CPPI is effectively guaranteeing nothing in this test case. And of course there are real costs associated with this structure, namely less capital participation in the investment basket and extra fees associated with the guarantee.

So we can conclude that if the return stream associated with the MBI investment basket looks anything like the average Canadian balanced fund, the need for a CPPI strategy is questionable at best. In this case National Bank Financial is essentially earning money for nothing.

In the interest of better understanding the value of the CPPI, we simulate returns using riskier investment strategies. Using returns for the S&P/TSX Composite Index over the past ten years, the CPPI takes on greater relevancy. Notice, once again the cost in terms of lower average returns under the CPPI, bearing in mind once again that this return does not take the extra fees of the CPPI structure into account.

S&P/TSX COMPOSITE INDEX	MIN	MEAN	MAX
Total Return With CPPI / Trading Level	97.0	169.11	418.1
Total Return Without CPPI / Trading Level	38.9	177.94	941.6

In the case of the index, there is a possibility of losses over the eight year time horizon under the simulated return scenarios. Note that the minimum return amounts to a more than 60 percent loss of capital over this time. The chance of loss under 500 return simulations for the S&P/TSX Composite Index is roughly 5 percent. Investors will have to assess if this is a reasonable level of risk to take given the costs of the CPPI.

Returns were also simulated using historical return distributions for the Fund Library Science & Technology Average. In this case, the CPPI structure is highly relevant though in one return scenario it fails to work effectively. Interestingly, in this instance the portfolio is not deleveraged quickly enough when losses were fast and steep.

Therefore, the minimum return under the CPPI is a near 50 percent loss of capital. In this case, the guarantor would be on the hook for the loss since the notes have a capital

guarantee. So, one could speculate that National Bank Financial would never offer a guaranteed note on science & technology funds using a CPPI structure.

With 500 simulations for the science & tech average, 30 percent of the total return simulations were under water after eight years. So, one could fully justify using a CPPI strategy with a science & tech mutual fund.

The CPPI structure is highly relevant for the average Science & Tech Fund return using simulation.

FUND LIBRARY SCIENCE & TECH AVERAGE	MIN	MEAN	MAX
Total Return With CPPI / Trading Level	51.4	161.8	501.0
Total Return Without CPPI / Trading Level	6.1	202.3	1830.7

Typically the commission for advisors ranges between four percent and five percent.

Early sales are often penalized by the issuing company.

The cost of leverage is associated with the cost of bank borrowing.

Fees

There may be layers of fees, depending on the nature and degree of management involved in the underlying investment. There are also fees associated with leveraging strategies.

The agent's fee is expressed as a maximum in the information statement; the actual fee listed in the client sheets may be slightly less. Typically the commission ranges between four percent and five percent; the trend is lower towards three percent. The charge may be either front-end (FE) or back-end loaded (DSC); the broad DSC trend, perhaps consistent with the length of the term, is a source of concern for unwary investors. There may also be a trailer in the neighbourhood of one percent. Start-up and administrative costs might take another one to two percent off the top (these may be referred to as a placement agent "commission", "offering expenses", etc.).

Notice then, that the actual initial level of the capital will not be 100, but rather 100 less these fees. In a case of, say, 5.5 percent total fees off the top, the initial level will not be 100 but 94.5; this necessitates at least a return of 5.82 percent (from 94.5) to get back to 100.

There may also be significant penalties for early sales (ESC). The penalty begins around five to seven percent, and declines in each subsequent year according to a stated schedule until nil. Investors are effectively locked in for at least a few years.

If managers are involved in the underlying investment, there is of course a management fee. For more passive management, 1.5 to 2 percent is a common management fee (also called a "programme fee" or "administrative fee"); for more active management of funds, managers are taking in excess of 2.5 percent MER. Hedge-fund managers are receiving one to two percent plus 20 percent of performance ("1&20"). Layering of fees here can be complex in a fund-of-fund arrangement.

Bank borrowing involved in guarantee strategies adds interest costs. Such costs will be expressed as a fixed percent above the London Inter-Bank Offer Rate (or LIBOR, applicable to the short-term inter-bank market): typically LIBOR + 0.5 to 1.5 percent. In rare cases there may also be the costs of a currency hedge.

Buried in the fine print may be other nickel-and-dime charges: various administrative-type fees. These extra charges are usually a few tenths of a percent.

It is never clear whether all fees are covered explicitly in the information statement.

Returns on investments held to maturity are taxed as interest income so there is an incentive to sell or redeem prior to maturity.

There is no legal obligation to maintain a secondary market.

It is expected that the notes would trade at some discount to NAV.

Tax Implications

Returns, if any, on investments held to maturity are taxed as interest income. Proceeds arising from early redemptions or sales, however, are taxed as capital gains (or losses!). There are costs associated with such preferential treatment, but the question is moot within an RRSP. For the investor holding notes outside of a tax shelter, however, there appears to be a strong incentive to sell prior to maturity, if feasible. Industry commentators consistently refer to this preferential treatment as fact, though apparently the Canada Revenue Agency (CRA) has yet to express any opinion on this issue.

Secondary Markets and Liquidity

The notes as a rule are not listed on any stock exchange. There is never any assurance that a secondary market will develop; liquidity is a serious concern.

Agents do in fact agree to maintain a weekly secondary market for the notes commencing at a specified date from issuance—the so-called “upstairs market”. However, there is no legal obligation to maintain this secondary market; and even if maintained (subject to conditions), the market may at any time be suspended or discontinued without notice at the discretion of the agent. Bid-offer spreads may be limited by the agent, generally to some percentage of the original capital amount. Sales and settlements can usually be made through FundSERV; over 150 notes are currently listed by FundSERV.

There is no way to predict how the note will perform in this secondary market, nor how liquid—or illiquid—this market will prove. It is expected that the notes would trade at some discount to NAV; this discount may end up being substantial. Estimates of the expected discount range from 3 to 4 percent (stray published references indicate 3.25 percent is a reasonable guess).

Pricing considerations are similar to those in options pricing, especially assumptions about volatility: interest rate movements over the term of the note (discounting inversely related to rates), the amount of time to maturity, liquidity of the market, among many factors. There is no way to evaluate the cost of premature sales.

It should be reiterated here that there is no guarantee of receiving at least 100 percent of the original capital unless the note is held to maturity.

The notes are not suited to income investors because they do not pay income.

There are three types of investors best suited to the guaranteed note structure.

Suitability for Investors

Structured notes have sold very well and the demand continues, but it is not clear whether such notes are appropriate for most investors.

Certainly, income-oriented investors should avoid these notes, since no income is assured (and income upon maturity is fully taxed as interest income; see section 5 above on tax implications).

There are at least three types of investors that should probably look at these notes. The one is the investor nearing retirement who has inadvertently broken open the nest egg in the bear market. Such a one can in no way afford to lose capital now, but may need to gamble on returns higher than fixed-income products, depending on financial goals.

The second investor wants exposure to alternative investments but might not qualify to invest directly (investors need to be accredited investors to qualify). Such a one can skirt the rules on the sale of hedge funds by snapping up notes that are geared to such underlying assets.

The last investor is the outright speculator. There may be a desire to hit a homerun in a risky investment without fear of losing the farm.

Generally, the investor is paying an insurance premium that compensates the issuer for taking risk but that, especially in a robust market environment, could also become exorbitant by severely limiting potential returns. The calculation, then, is how much that guarantee is worth to investors in light of the risk profile of the underlying assets.