

# Putable/Callable/Reset Bonds: Intermarket Arbitrage with Unpleasant Side Effects

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*In recent years, there has been a proliferation of so-called structured transactions in the fixed-income markets. These generally consist of a bond and an interest rate derivative, coupled as a single package for accounting purposes. Putable/callable/reset bonds (PCRBs), which have lately gained notable acceptance as a corporate financing vehicle, are a good example.*

*From the issuer's perspective, a PCRB is constructed by selling an intermediate bond and selling short a call option on a hypothetical Treasury bond. The apparent raison d'être for this package is intermarket arbitrage. The issuer can sell an option at a higher volatility (and therefore a higher price) in the derivatives market than as an embedded option in the cash market. While marketed as synthetic put bonds, PCRBs differ from conventional puttable bonds in significant ways, and the effects of these differences are becoming painfully apparent to issuers who have favored the structure.*

*This article describes PCRBs, and analyzes and critiques them from the perspectives of issuer, underwriter, and investor.*

A distinct trend over the last several years on Wall Street has been the proliferation of structured financing packages consisting of a bond and an interest rate derivative. The popularity of these structures can be attributed in part to their lack of transparent pricing,

which affords significant profit potential for investment banks. Putable/callable/reset bonds (PCRBs), otherwise known as synthetic put bonds, are a case in point.

Synthetic put bonds, originally involving grantor trusts, have been around for a while. But since January 1998, a new version — one that eliminates the grantor trust involvement — has gained popularity in the corporate borrowing community. The most conspicuous example is the \$1 billion three-tranche issue by Nabisco, reported in the *Wall Street Journal* of January 26, 1998, consisting of \$400 million of 6s due 2011, \$300 million of 6 1/8s due 2033, and \$300 million of 6 3/8s due 2035. Many other corporations, such as Wal-Mart, General Mills, AmSouth Bancorp, Philip Morris, and others, were quick to follow suit. The total volume of issuance in 1998 was in excess of \$20 billion.

Variiously called MOPPRS (mandatory par put remarketed securities) and REPS (reset put securities), among other things (see Exhibit 1), PCRBs are quite complex, and the typical prospectus yields little to the uninitiated. Their primary attraction to a borrower is that the option, sold separately in the derivatives market, generates a higher premium than it would in the cash market (that is, embedded in the bond).

We explain and critique the structure, using the first tranche of the Nabisco issue as an example.

## EXHIBIT 1

### Synthetic Put Bonds

Acronym	Standing for	Bank Name
CHEERS	Chase Extendible Remarketable Securities	Chase Securities
DRS	Dealer Remarketable Securities	J.P. Morgan
MOPPRS	Mandatory Par Put Remarketed Securities	Merrill Lynch
PEPPERS	Price Efficient Par Put Remarketable Securities	First Union Capital Markets
PURS	Putable Reset Securities	Goldman Sachs & Co.
RAPS	Redeemable and Putable Securities	Bear Stearns
REPS	Reset Put Securities	Morgan Stanley Dean Witter
SPURS	Structured Putable Remarketable Securities	Citigroup
SPYS	Synthetic Putable Yield Securities	Donaldson, Lufkin & Jenrette
TERMS	Term Enhanced Remarketable Securities	Credit Suisse First Boston

### I. THE STRUCTURE

These Nabisco bonds carry a 6% coupon, have a stated maturity of February 15, 2011, and are callable at par on February 15, 2001, by the *underwriter*, Morgan Stanley. If called, the bonds are subsequently remarketed as described below. If the bonds are not called, the *trustee*, on behalf of the investors, is required to put the bonds to the issuer at par, and the bonds are retired.

Thus, from the investor's point of view, these are simply three-year optionless bonds redeemed at par on February 15, 2001, either through a call by Morgan Stanley or through a mandatory put by the trustee. Accordingly, the coupon should be based on Nabisco's three-year rate. In fact, because of the apparent complexity of the structure, investors tend to pay slightly less than fair value for the bonds. Wall Street refers to this as a "structural premium."

The financing structure has an additional component. At the time the bonds were issued, Nabisco also sold to Morgan Stanley a European call option. This option is struck at par on a hypothetical ten-year 5.75% Treasury bond, whose maturity and notional principal match those of the Nabisco 6% bonds (see Nabisco Prospectus Supplement [1998]). Moreover, the February 15, 2001 exercise date of this option coincides with that of the embedded call option. Its payoff on exercise is defined as the present value of the hypothetical 5.75% Treasury bond discounted at the on-the-run ten-year Treasury rate less par. Nabisco received 3.28% of face value for the option, or \$13.12 million.

An important aspect of the structure's appeal to

corporate borrowers is that, for accounting purposes, the Treasury option and the bond are treated as a single package, as opposed to a "naked" option and a bullet bond. The \$13.12 million option premium, in Nabisco's case, is amortized over three years to the put/call date, increasing annual pretax earnings by \$4.37 million.

This desirable accounting treatment was challenged in a speech given on December 8, 1998, by Pascal Desroches, Professional Accounting Fellow at the Securities and Exchange Commission. Following an initial analysis of synthetic put bonds, the S.E.C. staff concluded as follows:

the proceeds received from assigning the embedded call option are in substance a premium received for the sale of a free-standing written option and should be accounted for as a liability at fair value with changes in fair value reported in earnings.

An official ruling has not been made as of this writing.

From Morgan Stanley's perspective, the option is a short-term trading vehicle that can be synthetically sold through its derivatives desk at a profit (Morgan Stanley remains the counterparty from Nabisco's perspective, however). The bid-ask volatility spread for over-the-counter options is roughly 2% to 4%. (OTC options are quoted by derivatives traders in terms of implied volatility.)

If the ten-year Treasury rate is below 5.75% on February 15, 2001, Morgan Stanley will exercise its Treasury bond option. The option will not be cash-set-

bled, however. Instead, Morgan Stanley will collect the payoff as follows:

- Call the Nabisco bonds from the public at par.
- Reset the coupon for the remaining ten years so that the bonds will sell at a price equal to the ascribed value of the option plus par, i.e., the present value of the hypothetical ten-year 5.75% Treasury bond, discounted at the on-the-run ten-year Treasury rate. The reset coupon, as discussed below, will be at least 5.75% plus Nabisco's then ten-year reoffer spread.
- Remarket the Nabisco bonds, and keep the difference between the proceeds and par (the cost of calling the original bonds).

## II. BACKGROUND: PUTABLE BONDS

To appreciate the rationale behind PCRBs, consider a conventional puttable bond from the perspective of the borrower. The borrower sells to the investor a one-time put option exercisable at par, and is compensated in the form of a below-market coupon.

Consider, for instance, a BBB industrial that sells 13-put 3 bonds. Assume that the borrower's rate for three-year optionless debt is the three-year Treasury rate (say, 5.34%) plus 66 basis points, or 6.00%. With an implied short rate volatility of about 8.00%, typical for corporate puttable bonds, the fair coupon will be around 5.90% assuming an upward-sloping yield curve (ten-year optionless rate at 6.45%). Thus the savings relative to the three-year optionless rate is 10 basis points (6.00% – 5.90%).

If, three years later, the borrower's ten-year rate is above 5.90%, the bonds will be put. But, if the rate is below 5.90%, investors will keep the bond for an additional ten years. Therefore, the floor of the borrower's ten-year refinancing rate in three years is 5.90%.

A notable disadvantage of embedded put options, from the perspective of the borrower, is their comparatively low value relative to embedded call options. For example, in 1993, when the yield curve was steeply upward sloping, embedded puts were priced using volatilities close to 5%, while embedded calls were priced closer to 12%. The current range is roughly 7% to 9% for puttables and 11% to 14% for callables. Because of this disparity, issuers pay dearly when they buy an embedded call option but receive

modest compensation when they sell an embedded put option, even though an embedded put option is not fundamentally different from an embedded call option. Indeed, as we will show, a conventional puttable bond is essentially a callable bond, except that it is the investor, rather than the borrower, who owns the call option.

A further problem (but beyond the scope of this article) is that puttable bonds are unattractive on an after-tax basis. Boyce and Kalotay [1979] show that a taxable borrower should be a buyer rather than a seller of fairly priced embedded options. This result is due to the complex interaction of after-tax cash flows and after-tax discount rates.

## III. PUTABLE OR EXTENDIBLE?

An extendible bond can be kept by its holder beyond its stated maturity for some additional term. Extendible bonds can be found in some debt markets outside the U.S., Canada, for one. Conceptually, the extension process can be decomposed into two steps: The investor allows the outstanding bonds to mature, and then purchases at par new bonds with the same coupon but a longer maturity. *Thus, by keeping the bond beyond its original maturity, the holder effectively exercises a call at par on a bond with an identical coupon.*

Note that the option is exercised only if the interest rate to the extended maturity is below the coupon rate. Otherwise, the bonds are allowed to mature as scheduled, and the borrower may need to refinance at prevailing market rates.

For the borrower, the behavior of a puttable bond is no different from that of an extendible bond. If rates are below the coupon on the put date, the holder lets the put expire and keeps the bond to maturity. If rates are higher, the holder exercises the put, and then the borrower refinances at market rates. This is precisely how an extendible bond behaves.

As we see, from a valuation perspective, puttable and extendible bonds are equivalent. The subtle difference is the corresponding underlying bond. For a puttable, it is a longer bond that can be shortened; for an extendible, it is a shorter bond that can be lengthened. Because it is very similar to a PCRB, the extendible bond is the more convenient base case structure to consider for the purpose of this discussion.

Let us take a closer look at the embedded put/extension options. If the yield curve is upward sloping, which is normally the case, then at the time of

issuance the embedded put option is in the money; and therefore its value is relatively high. The corresponding call (extension) option, in contrast, is out of the money and therefore has a relatively low value.

Exhibit 2 illustrates this point by comparing a 5.90% 13-put 3 bond against a 5.90% three-year bond extendible to thirteen years. At an 8.00% interest rate volatility, the value of the put option is 6.45%, while that of the call (extension) option is 0.26% of the face amount.<sup>1</sup>

#### IV. SYNTHETIC PUTABLE BONDS

Next, we synthetically replicate a putable bond as an extendible bond, using the 13-put 3 as an example. The issuer can achieve this as follows:

- Sell at par an optionless three-year bond with a 6.00% coupon.
- Sell a European call option on a ten-year 5.90% bond exercisable in year 3 at par.<sup>2</sup> The option premium received, at 8.00% volatility, is roughly 0.26% of the face amount.
- Invest the 0.26% in a three-year annuity, which, assuming the three-year Treasury rate is 5.34%, would yield 0.10% per year.

Thus, for the initial three years, the net coupon is 5.90% (6.00% – 0.10%).

If the borrower's ten-year rate is above 5.90% at the end of year 3, the option will not be exercised, and the borrower refinances at the market rate. If the rate is below 5.90%, the investor exercises the call option and buys a ten-year 5.90% bond at par from the borrower. Consequently the issuer's net coupon during the initial three years is 5.90%, and it will stay at that level only if rates decline.

## EXHIBIT 2

### Putable Bonds versus Extendible Bonds

Structure	5.90% 13-Put 3	5.90% 3-Extend to 13
Underlying Bond	13-Year Bullet	3-Year Bullet
Value of Underlying	93.55%	99.74%
Value of Option	6.45%	0.26%
Total Value	100.00%	100.00%

BBB Industrial credit, three-year rate @ 6.00%, thirteen-year rate @ 6.64%, short rate vol @ 8%.

Clearly, this structure behaves the same way as the 5.90% 13-put 3 bond.

#### V. PUTABLE/CALLABLE/RESET BONDS: ANALYSIS

While PCRBs are structurally similar to extendible (or, equivalently, putable) bonds, *the call option sold is on a hypothetical Treasury bond, rather than on the borrower's own bond.*

Recall that the Nabisco package of 6s of 2011 can be decomposed into two parts:

- A three-year 6% bond, sold at par to investors.
- A call option on a hypothetical ten-year 5.75% Treasury bond, sold to Morgan Stanley for 3.28% of face value as premium.

This option premium was in line with the 13%-14% volatility of the derivatives market at the time — considerably higher than the 8% volatility for putables in the bond market. Conceptually, Nabisco could invest this 3.28% premium in a three-year annuity at the three-year risk-free rate of 5.34%, yielding annual payments of 1.21% of face, thus reducing the effective borrowing rate during the initial three years from 6.00% to 4.79%.

Note that because the call option is at the money, the 3.28% option premium is much higher than the 0.26% in the example in Exhibit 2, and hence the interest savings during the initial three years are commensurately larger.

What happens if the option is exercised, and the bonds are remarketed with a reset coupon? It can be shown that, as long as Nabisco's yield curve is upward sloping, the refinancing coupon will be at least 5.75% plus Nabisco's then ten-year spread.

For example, if the spread is at 95 basis points — as at the time the bonds were issued — the refinancing coupon will be at least 6.70%. As with a conventional putable bond, the borrower is exposed to the risk that its ten-year spread will widen. At the roughly 220 basis point spread observed in late 1998, Nabisco's coupon would be above 7.95%.

Nabisco also bears the risk that investors may demand a coupon higher than fair. In the primary market, bonds are customarily sold to the public at or slightly below par; partly because of their undesirable accounting treatment, large original issue premiums are virtually non-existent.

In Exhibit 3, we compare the costs, as measured by internal rates of return, of a conventional 5.90% thirteen-year bond puttable in three years, and a 6.00% PCRB sold at par combined with a 5.75% Treasury call option sold for 3.28% of face value. As we can see, when rates are below 5.90% at the end of the third year, the conventional puttable has the lower cost, as its internal rate of return remains 5.90%. The break-even rate is 6.23%. At high rates, both bonds have to be refinanced, but the 6% PCRB provided the borrower with a large premium up-front, without any adverse consequences compared to a conventional puttable bond.

Some discussion is in order regarding our original reference to intermarket arbitrage. The volatilities in the cash (bond) market and the derivatives market are not strictly amenable to an apples-to-apples comparison, because the reference yield curves are different.<sup>3</sup> It is well established that the market value of an embedded option is significantly lower than that of a comparable naked option/swaption. One manifestation of this fact is the routine practice among U.S. agencies of issuing callable bonds and synthetically selling the embedded call to achieve all-in costs of 20 to 40 basis points below LIBOR.<sup>4</sup> There are literally hundreds of Federal Home Loan Bank bonds currently outstanding whose call options have been sold in this manner (“monetized,” in Wall Street parlance).

## VI. MARKET UPDATE

September 1998 marked a milestone for synthetic put bonds, with the remarketing date of the earliest synthetic put issue. This was the General Motors Acceptance Corporation \$600 million 6.38% 7-put/call 2 issue, brought to market in 1996 as PATS (pass-through asset trust securities) with essentially the same features of the structure under discussion.

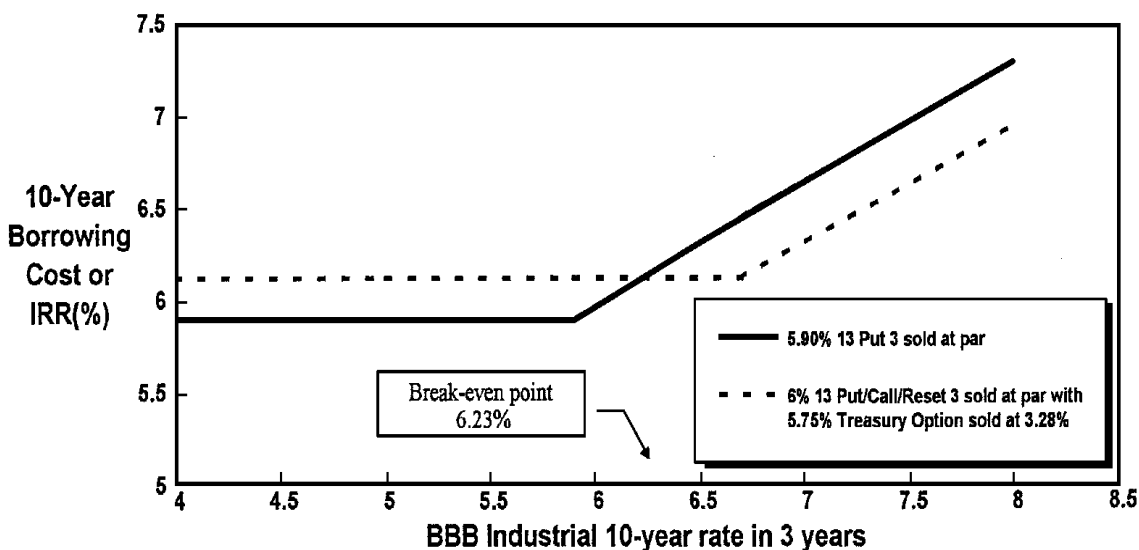
Because the five-year Treasury rate in September 1998 was 4.42% — much lower than the option’s 6.45% strike — the value of the option was approximately 9 points, or \$54 million. In addition, due to the negative developments taking place in Russia and the Far East, GMAC’s five-year new-issue spread had widened considerably, along with those of most corporate issuers.

In plain language, the bonds had to be remarketed under extremely undesirable market conditions. Unsurprisingly, the remarketing failed, and in order to settle its obligation GMAC was forced to renegotiate terms with the underwriter. It is our understanding that, as of January 1999, the bonds had not yet been remarketed.

In spite of this fiasco, Wall Street continues to promote synthetic put bonds with gusto.

### EXHIBIT 3

#### Conventional Puttable Bonds Are Preferable to Puttable/Callable/Resets if Rates Decline



## VII. CONCLUSION

Although marketed as synthetic put bonds, because of the extent of the optionality involved, PCRBs tend to be fundamentally different from conventional puttable bonds. For example, in the Nabisco case, the 3.28% premium for the at-the-money Treasury option was much higher than the 0.26% value of the out-of-the-money *extension option* in a conventional puttable bond. In exchange, the issuer of a PCRB has virtually given up any chance of refinancing at a rate lower than or equal to the initial coupon.

If a borrower elected to sell an out-of-the-money call option, the risk profile of the package would be similar to that of a conventional puttable bond. But, to date, most PCRBs have been structured with call options near the money.

To extract an extension option value of 3.28% from a conventional puttable bond, the put price would have to be substantially above par (a phenomenon yet to be observed in the marketplace). But an above-par put would be detrimental to the borrower's earnings. Another alternative is to set the coupon on the puttable bond above current market levels and sell it at a premium. But such bonds are not readily marketable, as discussed above.

PCRBs allow the borrower to sell virtually arbitrary call options on Treasury bonds. The borrower can extract a high premium by setting the strike near the money, but then the likelihood of option exercise will also be great, resulting in above-market interest cost beyond the option exercise date.

The current accounting treatment of PCRBs combines the bond and the Treasury option as a single package. This appeals to corporate borrowers who are willing to take a speculative position in the options

market in order to improve reported earnings. But, as noted earlier, issuers may no longer rely on this treatment to continue. Overall, the debt management rationale behind the puttable/callable/reset structure is questionable at best.

## ENDNOTES

<sup>1</sup>All results are obtained by recursive lattice-based valuation using the Black-Karasinski process with the stated short-term volatility and zero mean reversion.

<sup>2</sup>This part of the structure is conceptual; call options or warrants on corporate bonds are seldom seen in the marketplace.

<sup>3</sup>Credit/default risk is incorporated in the valuation of corporate bonds by adding credit spreads to the Treasury rates. In the derivatives market, values are based strictly on the swap curve; counterparty risk is addressed by other means such as collateral.

<sup>4</sup>Agencies convert fixed-rate callable debt into sub-LIBOR floating-rate debt by entering into a cancellable swap to receive fixed and pay LIBOR. The premium received for the embedded swaption reduces the "pay" obligation on the swap, effectively making it sub-LIBOR. If the swaption is exercised, the call is triggered, and the whole financing is unwound.

## REFERENCES

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