THE CLASSIFICATION OF RETURNS FROM AN INVESTMENT IN FIXED OR 'NIL' INTEREST SECURITIES

by

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In recent months there has been much debate regarding the treatment, from a taxation viewpoint, of the difference between the purchase price of a fixed interest security and its redemption value (par), particularly where the price paid for the security in the secondary market is less than the redemption value.

Some have said that this latter difference is a 'tax free' capital gain, others have said it is a 'taxable' capital gain and another section admits to not knowing how it should be categorised.

It appears to this author that the underlying reason for these differences of opinion is an unawareness of WHY the purchase price is below redemption value (par) or, for that matter, WHY this price should be equal to, or above, redemption value.

The answer to this 'WHY' becomes apparent when the mathematics applied to the question of purchase price evaluation are known and several definitions of important terms used in this area of investment are understood. *(Refer to appendix for definitions).*

THE MATHEMATICS OF PRICE EVALUATION OF FIXED INTEREST SECURITIES TO RETURN A REQUIRED ANNUAL REDEMPTION YIELD

Before proceeding with this section several observations should be made with regard to the difference between the price of a security and its par value. They are:—

(1) In the debate on issues trading below their par value no mention has been made of issues trading ABOVE their par value. This situation arises when the return required by the investor is BELOW the interest paid by the borrower annually, and will be the case if and when the yield curve, in the future, is BELOW the current curve.

The question could be asked, are those proponents of the 'tax free capital gain' theory in issues purchased below their par value prepared to forego the 'loss' on redemption of issues purchased at a price in excess of their par value and, at the same time, paying tax on the coupon received which, in such cases, will be above the investor's real return?

(2) An issue of three year bonds with a par value of $100 is offered for subscription with NO interest paid but offering a return of 15 per cent per annum to the investor to redemption. To achieve this return the bonds would be offered at a price of $65.75 per $100 face value. With this type of issue surely no one could say that the total of $34.25 earned on this investment is a 'tax free capital gain'?

(3) A borrower in the Primary Market offers for subscription a bond below its par value thus effectively offering potential investors an annual earnings per cent (redemption yield) in excess of the annual rate per cent paid on the bond by the borrower. Can it be said that the difference between the issue price and the par value to be repaid at redemption is a 'tax free capital gain' and that tax is paid on the coupon income alone rather than the real earnings (redemption yield)!

NOTE: Examples of this type of issue are the recent Loans by-Tender offered by the Commonwealth Government.

An examination of the following examples shows just what proportion of all receipts from a fixed or nil interest investment is earnings as opposed to the repayment of the purchase price and thus demonstrates that there is NO 'capital gain' on the redemption of these securities irrespective of the purchase price paid.

The basis for the calculation of the price to be paid for a fixed or nil interest security to achieve a required redemption yield is — the potential investor knows exactly what his FUTURE receipts will be — interest paid by the borrower and par — and thus the price he pays for his investment will be the sum of each of these future receipts discounted at the rate of return required by the investor for the number of periods applicable to each receipt.

To calculate the Present Value of each Future Receipt the standard discount formula is applied to each of these receipts.

This formula is:—

$PV = FV/(1 + i)^n$ where

PV = the Present Value of Future Receipts.
FV = the Known Future Receipt.
i = the Required Periodic Earnings Per cent (Redemption Yield) — expressed as a decimal.
n = the Number of Periods (time periods) from the Date of Valuation to Maturity.

EXAMPLE 1

A Bond is to be purchased in the Secondary Market carrying a 12.5 per cent annual coupon maturing in two years with the purchaser requiring annual earnings of 17 per cent on his investment each year to redemption (Redemption Yield).

CALCULATION OF PURCHASE PRICE

FUTURE RECEIPTS $	*FORMULA APPLIED*		*PRESENT VALUE-$*
1st COUPON 12.50	$12.5/(1.17)^1$	=	$10.68
2nd COUPON 12.50	$12.5/(1.17)^2$	=	9.13
PAR VALUE 100.00	$100/(1.17)^2$	=	73.05
	PURCHASE PRICE	=	$92.86

ACTUAL ANNUAL EARNINGS

	YEAR 1		*YEAR 2*	
	ORIGINAL COST (1)	*INTEREST @ 17% pa (2)*	*COMPOUNDED COST (1)+(2)*	*INTEREST @ 17% pa*
1st COUPON	10.68	1.82	—	—
2nd COUPON	9.13	1.55*	10.68	1.82
PAR VALUE	73.05	12.42*	85.47	14.53
ANNUAL INVESTMENT	92.86		96.15	
ANNUAL RETURN $		15.79		16.35
% ON ANNUAL INV.		17.0		17.0

VERIFICATION OF ANNUAL RETURNS

	REQUIRED RETURNS		*ACTUAL RECEIPTS*	
	INTEREST (1)	*CAPITAL (2)*	*INTEREST (COUPONS)*	*PAR (2)*
YEAR 1	15.79	—	12.50	—
YEAR 2	16.35	92.86 (Cost)	12.50	100.00
TOTALS (1) + (2)	$125.00		$125.00	

EXAMPLE 2

A Bond is to be purchased in the Secondary Market carrying an 18 per cent annual coupon maturing in two years with the purchaser requiring annual earnings of 15 per cent on his investment each year to redemption (Redemption Yield).

CALCULATION OF PURCHASE PRICE

FUTURE RECEIPTS $	*FORMULA APPLIED*		*PRESENT VALUE-$*
1st COUPON 18.00	$18/(1.15)^1$	=	$15.65
2nd COUPON 18.00	$18/(1.15)^2$	=	13.61
PAR VALUE 100.00	$100/(1.15)^2$	=	75.61
	PURCHASE PRICE	=	$104.87

ACTUAL ANNUAL EARNINGS

	YEAR 1		*YEAR 2*	
	ORIGINAL COST (1)	*INTEREST @ 15% pa (2)*	*COMPOUNDED COST (1)+(2)*	*INTEREST @ 15% pa*
1st COUPON	15.65	2.35	—	—
2nd COUPON	13.61	2.04*	15.65	2.35
PAR VALUE	75.61	11.34*	86.95	13.05
ANNUAL INVESTMENT	104.87		102.60	
ANNUAL RETURN $		15.73		15.40
% ON ANNUAL INV.		15.0		15.0

VERIFICATION OF ANNUAL RETURNS

	REQUIRED RETURNS		*ACTUAL RECEIPTS*	
	INTEREST (1)	*CAPITAL (2)*	*INTEREST (COUPONS)*	*PAR (2)*
YEAR 1	15.73	—	18.00	—
YEAR 2	15.40	104.87	18.00	100.00
TOTALS (1) + (2)	$136.00		$136.00	

EXAMPLE 3

A Bond is offered on the Primary Market carrying NIL interest and maturing in two years. The offered price is $71.21 per $100 par value to give the subscriber an annual return of 18.5 per cent on his investment.

CALCULATION OF PURCHASE PRICE

FUTURE RECEIPTS $	*FORMULA APPLIED*		*PRESENT VALUE-$*
PAR VALUE 100.00	$100/(1.185)^2$	=	71.21
	PURCHASE PRICE	=	$71.21

ACTUAL ANNUAL EARNINGS

	YEAR 1		*YEAR 2*	
	ORIGINAL COST (1)	*INTEREST @ 18.5% pa (2)*	*COMPOUNDED COST (1)+(2)*	*INTEREST @ 18.5% pa.*
PAR VALUE	71.21	13.18*	84.39	15.61
ANNUAL INVESTMENT	71.21		84.39	
ANNUAL RETURN $		13.18		15.61
% ON ANNUAL INV.		18.5		18.5

VERIFICATION OF ANNUAL RETURNS

	REQUIRED RETURNS		*ACTUAL RECEIPTS*	
	INTEREST (1)	*CAPITAL (2)*	*INTEREST (COUPONS)*	*PAR (2)*
YEAR 1	13.18	—	—	—
YEAR 2	15.61	71.21	—	100.00
TOTALS (1) + (2)	$100.00		$100.00	

EXAMPLE 4

A Bond offered on the Primary Market at par ($100) carrying a coupon of 16 per cent per annum will give the investor a return of 16 per cent annually to redemption as his annual investment is always $100 and the interest received from the borrower will thus be his annual return (Redemption Yield).

It should be noted that the interest earned under the heading 'YEAR 1 INTEREST' in the ACTUAL ANNUAL EARNINGS Tables in Examples 1, 2 and 3 and marked with an asterisk (*) is not actually received by the investor in that year but is automatically re-invested for a further period or periods.

Whilst the Examples given apply only to a two year issue with the interest paid by the borrower annually the same principles and mathematics apply to longer term securities and to securities paying interest more than once a year.

The conclusion to be drawn from the preceding Examples is that the annual interest (or earnings) on investments in Fixed or Nil Interest Securities is in fact the dollar amount of the redemption yield per cent applied to the amount invested each year and NOT the interest received each year from the prime borrower. As the conclusion has been clearly proven from the mathematics applied in the evaluation of price paid for these investments it is hoped that the article may help to resolve the many differences of opinion prevailing with regard to the categorisation of capital return interest and earnings on these investments.

Finally, it should be stressed that the concepts presented in this paper are not new. In fact the Stock Exchanges of Sydney and Melbourne have, since 1976, quoted semi-government securities and company debentures on a 'yield to redemption' basis and converted the yield to a price using the mathematics applied in the examples given.

APPENDIX

DEFINITIONS

Fixed Interest Security
A bond, debenture or any other type of loan instrument whereby the borrower undertakes to pay the beneficial lender a FIXED annual rate of interest, paid at fixed periodic intervals for a set length of time, and to repay the beneficial holder of that instrument the face value of the security at maturity.

NOTE: For the sake of clarity, the term 'bond' will be used exclusively in this article, however the principle applies equally to other types of loan instruments.

'Nil' Interest Security
A bond issued by a borrower at a price above or below its par value with NO periodic interest payments paid by the borrower (the price at which the bond is issued determines the return to the lender) with the borrower undertaking to pay the par value of the bond to the beneficial holder at redemption.

NOTE: This type of issue in its 'below par value' form is quite common on the European market and there have been some issues of this version made by borrowers on the Australian market. To the best of this author's knowledge no issues have been offered 'above' their par value.

Primary Market
The market in which the bond is originally offered by the borrower to the prime lender.

Secondary Market
The market where bonds issued on the Primary Market are traded. On this market the prime borrower is unchanged as is the original terms of the loan however the lender or holder changes as may the return on the investment.

Par Value
The value of the bond to be repaid by the borrower to the beneficial holder of that bond at maturity.

Redemption Yield
The rate of return the beneficial lender will achieve per $100 invested in the loan EACH YEAR to maturity.