

DETERMINATION > FINANCIAL ARRANGEMENTS > GENERAL

Yield to Maturity Method

Issued: 13 May 1987

G3

This Determination may be cited as "Determination G3: Yield to Maturity Method".

1 Explanation (which does not form part of the determination)

This Determination states how the yield to maturity method shall be applied to a financial arrangement to calculate income derived or expenditure incurred for the purposes of section 64C of the Income Tax Act 1976.

It applies to all financial arrangements where the amounts and dates are known not later than the first balance date of the issuer or holder after issue or acquisition, as the case may be, and determined in New Zealand currency.

The approach adopted is to define a constant annual rate R representing the yield to maturity of all the cash flows in the financial arrangement. Income derived and expenditure incurred is assumed to be compounded on the date of each payment. If they wish holders or issuers may simplify the calculations by using regular periods, such as half-years or weeks, where most or all of the cash flows occur at such intervals.

However where a period between payments is longer than one year, income derived and expenditure incurred must be compounded at yearly intervals.

In general there is no explicit formula for a yield to maturity in terms of the cashflows. The yield to maturity is defined as the discount rate at which the cashflows accumulate to zero. As part of the method, the amount of income derived or expenditure incurred to be compounded at the end of each period is calculated as a fraction F multiplied by the principal outstanding during the period. This income derived and expenditure incurred is then added to the principal outstanding for the next period (if one exists). The final payment must equal the principal outstanding during the final period plus the income derived or expenditure incurred during that period.

The amount of income derived or expenditure incurred by the holder or issuer in respect of a period is to be apportioned among income years in the period on a daily basis using Determination G1: Apportionment of Daily Income and Expenditure.

In most normal commercial financial arrangements, the annual rate will be unique, positive and less than 100 percent per annum; arrangements that do not meet these criteria are excluded and may be submitted for individual consideration by the Commissioner.

2 Reference

This Determination is made pursuant to section 64E(1)(a) of the Income Tax Act 1976. It defines the application of the yield to maturity method to financial arrangements of the class described in paragraph 3 of this Determination.

3 Scope

This Determination applies to the class of financial arrangements that has the following attributes—

- a) All amounts payable or receivable under the financial arrangement, and the dates on which the amounts are payable or receivable, are known not later than the first balance date of the issuer or holder following the date of issue or acquisition as the case may be; and
- b) All such amounts are determined in New Zealand currency—
but does not apply to any financial arrangement in respect of which the annual yield to maturity rate R determined in accordance with paragraph 6 would be—
- c) Not unique; or
- d) Less than or equal to zero; or
- e) Greater than 100 percent.

4 Principle

The yield to maturity method apportions the total income or expenditure under a financial arrangement so that—

- (a) The amount apportioned in respect of each period between payments represents a constant annual rate R on the amount of the principal outstanding during each period; and
- (b) The rate R is such that at the time the financial arrangement is issued or acquired the discounted value of the money to be given and received accumulates to zero.

The amount apportioned to each period is then allocated to income years on a daily basis in accordance with Determination G1: Apportionment of Daily Income and Expenditure.

5 Interpretation

(1) In this Determination—

(a) Unless the context otherwise requires, expressions used have the same meanings as in section 64B to 64M of the Income Tax Act 1976:

(b) “The amount of the principal outstanding” during any period shall be equal to—

(i) The amount of the principal outstanding during the previous period (if any); *plus*

(ii) The amount (if any) payable by the holder or receivable by the issuer (as the case may be) immediately before the beginning of the period; *plus*

(iii) The amount calculated in respect of the previous period in terms of paragraph 6(a) of this determination;

less

(iv) The amount (if any) receivable by the holder or payable by the issuer (as the case may be) immediately before the beginning of the period:

(c) “Period” and “period between payments” means a term commencing immediately after a payment is payable or receivable and ending when the next payment is payable or receivable: Provided that if a period exceeds one year it shall be deemed to comprise one or more periods each of one year followed (or preceded, at the option of the holder or issuer as the case may be) by a period of less than one year.

(2) For the purposes of applying paragraph 6(a) of this Determination—

(a) Where the greatest common divisor of all the periods between payments is—

(i) A year or 12 months, N shall be taken as 1:

(ii) A halfyear or 6 months, N shall be taken as 2:

(iii) A quarter or 3 months, N shall be taken as 4:

(iv) A month, N shall be taken as 12:

(v) A fortnight, N shall be taken as 26:

(vi) A week, N shall be taken as 52.

(b) Where 1 or 2 periods have a greatest common divisor different to the greatest common divisor of all other periods this fact shall be disregarded, and for each of those 1 or 2 periods N shall be taken as 365 divided by the number of days in the

period including the ending date of the period but excluding the starting date of the period.

6 Method

If R is a constant annual rate and if—

(a) In respect of each period between payments an amount is obtained by multiplying the amount of the principal outstanding during that period by a fraction F where—

$$F = \frac{R}{100 \times N}, \text{ and}$$

N is—

- (i) The amount defined in paragraph 5(2) of this Determination; or
- (ii) Where paragraph 5(2)(a) of this Determination does not apply, 365 divided by the number of days in the period (including the ending date of the period but excluding the starting date of the period)—

which amount forms part of the principal outstanding during the next succeeding period; and

(b) The total of the principal outstanding during the final period between payments and the amount obtained in respect of that period pursuant to subparagraph (a) of this paragraph equals the amount of the final payment,—

the amount obtained pursuant to subparagraph (a) shall be the amount of income derived or expenditure incurred in respect of that period by the holder or issuer (as the case may be).

7 Example

On 12 March 1987 a holder acquires for \$1,012,500 the right to receive the following income—

	\$
15 May 1987	70,000
15 November 1987	70,000
15 May 1988	70,000
15 November 1988	1,070,000

The holder balances on 31 March, and chooses to allocate income on a 365 day basis.

The period are expressed in 6-month multiples, so $N = 2$, except for the first (broken) period for which

$$N = \frac{365}{64} = 5.703125.$$

It will be found that the constant annual rate R is 16.2308% per annum.

The following schedule may then be constructed, showing the income in respect of each period:

<u>Period ending</u>	<u>Principal outstanding</u>	<u>Income in respect of period</u>	<u>Payments received at end of period</u>
	\$	\$	\$
15/5/87	1,012,500	28,815 (1)	70,000
15/11/87	971,315	78,826 (2)	70,000
15/5/88	980,141	79,542	70,000
15/11/88	989,638	80,317	1,070,000
<u>Totals</u>		<u>267,500 (3)</u>	<u>1,280,000</u>

Notes (1) $\frac{16.2308}{100 \times 5.703125} \times \$1,012,500$

(2) $\frac{16.2308}{100 \times 2} \times \$971,315$

(3) Check = 1,280,000 – 1,012,500

The following schedule illustrates the allocation to the holder's income years on a 365 day basis:

<u>Period ending</u>	<u>Income in respect of period</u>	<u>Days in period</u>	<u>Allocation to ...</u>		<u>Income amount</u>	<u>Income year</u>	<u>Total amount</u>
			<u>income year</u>	<u>days</u>			
	\$				\$		\$
15/5/87	28,815	64	1986/87	19	8,554	1986/87	8,554
			1987/88	45	20,261		
15/11/87	78,826	184	1987/88	184	78,826	1987/88	158,962
			15/5/88	182	59,875		
15/11/88	80,317	184	1988/89	45	19,667	1988/89	99,984
			1988/89	184	80,317		
<u>Totals</u>	<u>267,500</u>				<u>267,500</u>		<u>267,500</u>

Note: The yield to maturity method will enable the calculation of an amount of income or expenditure for the final income year to which a financial arrangement relates. However for the purposes of calculating the amount deemed to be assessable income or expenditure

incurred in the final income year it is necessary to apply section [64F](#) of the Income Tax Act 1976 — the base price adjustment.

About this document

General determinations set out the Commissioner's view on how the financial arrangements rules apply to a specific type of financial arrangement. All general determinations are binding on the Commissioner and some are also binding on taxpayers.