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Question 1

Today’s Time is t0

Present Value (F0) = Future Value (F1) \* Discount Factor (d)

=> d = F0 / F1

1.2

Today’s time: t0

Future’s time: t1

Discount Factor (d) = e ^ [-r \* ( t1 - t0 ) ]

1.3

Discount Factor (d) = e ^ [ -r \* ( t1 - t0 ) ]

where

t1 = 1.5

t0 = 0

r = 0.04 ( 4% = 0.04 )

so d = e^[ -0.04 \* ( 1.5 – 0 ) ]

= 0.9418

1.4

F0 = F1 \* d

where

d = 0.9418 (from Question 1.3 answer)

F1 = 120

So F0 = 120 \* 0.9418

= 113.02

Question 2

My student ID is 23399066

So

△y1.0 = 2 \* ( 2339 / 10000 )

= 0.4678

△y1.5 = -2 \* ( 9066 / 10000 )

= -1.8132

y0.5 = 5%

y1.0 = ( 5 + △y1.0 ) % = ( 5 + 0.4678 ) %

= 5.4678%

y1.5 = ( 5 + △y1.5 ) % = ( 5-1.8132 ) %

= 3.1868%

d0.5 = 1 / [ 1 + ( y0.5 / 2 ) ]

= 1 / [ 1 + ( 0.05 / 2) ]

= 0.9756

d1.0 = ( 1 – y1.0 \* d0.5 /2 ) / [ 1 + ( y1.0 / 2 ) ]

= ( 1 – 0.054678 \* 0.9756/2 ) / [ 1 + ( 0.054678 / 2 ) ]

= 0.9474

d1.5 = [ 1 – ( y1.5 \* d0.5 / 2 ) – ( y1.5 \* d1.0 / 2 ) ] / [ 1 + ( y1.5 / 2) ]

= [ 1 – ( 0.031868\*0.9756/2 ) – ( 0.031868\*0.9215/2 ) ] / [ 1+( 0.031868/2 ) ]

= 0.9546

r = -ln(d) / (t-t0 )

r0.5 = -ln ( d0.5 ) / 0.5

= -ln ( 0.9756 ) / 0.5

= 4.94%

r1.0 = -ln ( d1.0 ) / 1.0

= -ln ( 0.9474 ) / 1.0

= 5.40%

r1.5 = -ln ( d1.5 ) / 1.5

= -ln ( 0.9546 ) / 1.5

= 3.10%

Question 3

CF0 = d0.5 \* ( CF0.5 ) + d1.0 \* ( CF1.0 ) + d1.5 \* ( CF1.5 )

CF0 = d0.5 \* ( CF0.5 ) + d1.0 \* ( CF1.0 ) + d1.5 \* ( CF1.5 )

Where

CF0.5 = 2.0

CF1.0 = 2.0

CF1.5 = 102.0

d0.5 = 0.9756

d1.0 = 0.9474

d1.5 = 0.9546

so

CF0 = 0.9756 \* 2.0 + 0.9474 \* 2.0 + 0.9546 \* 102.0

= 101.2152

Question 4

B = [ (c/2) / (1+y/2)] + [ (c/2) / (1+y/2)^2 ] + [ (F+ (c/2)) / (c+y/2)^3 ]

Where F = 100, c = 4

|  |  |
| --- | --- |
| y (%) | B |
|
| 0 | 106.0000 |
| 1 | 104.4550 |
| 2 | 102.9410 |
| 3 | 101.4560 |
| 4 | 100.0000 |
| 5 | 98.5720 |
| 6 | 97.1714 |
| 7 | 95.7975 |
| 8 | 94.4498 |
| 9 | 93.1276 |

In my solution of Question 3

The Bmarket is 101.1634

* B3 (101.4560) > Bmarket (101.2152) > B4 (100.0000)
* ylow = 3 & yhigh = 4
* (ylow+ yhigh) / 2 = 3.5
* B3.5 = 100.724
* I use c++ coding to compute the answer.

Question 5

Because B3.0 (101.4560) > Bmarket (101.2152) > B3.5 (100.724)

* yhigh will be update from 4 to ymid = 3.5
* ( yhigh + ylow ) / 2 = ( 3.5 + 3 ) / 2 = 3.25
* B3.25 = 101.089

Question 6

Not work.

In the coding, if n =1 , we will always get the answer B is 0.0 because of the for loop.

In the for loop condition, for (int i = 1; i < n; ++i) ; therefore, if n = 1, the loop will not do anything and return.

For example, F=100, c=4, y =2, n=1

The answer should not be 0, but the coding will return 0.