# ACCA

## AFM

## Advanced Financial Management

# TUITION NOTES

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## HOW TO USE THESE NOTES

These notes should be used together with the latest revision kit.

Rework all questions done with me on your own. The key to passing this paper is practicing exam standard questions under time. Always time yourself whenever you practice a question. Remember all you need to do is gain enough marks to 50%, get the basics right, if you get stuck on particular part of a question leave it and earn marks elsewhere, there is no time to get stuck, stop & think. Practice! Practice! Practice! The more you do this the easier the questions become, and the challenging bits become straightforward.

You can use your text book for reference only.

Read examiners articles and keep track of current issues.

## EXAM FORMAT

### Section A

- One Compulsory Case Study Question 50 marks
- Roughly half of available mark will be theory
- There will be 40 technical marks and 10 professional skills marks

### Section B

- 2 Compulsory questions
- 25 marks each 50 marks
- Each of the question will have 20 technical marks and 5 professional skills marks
- There will NOT be a wholly narrative question

**Note**: Investment Appraisal and Treasury & Risk Management will be examined every sitting. Could be in Section A or Section B.

## Formulae

### Modigliani and Miller Proposition 2 (with tax)

$$k_e = k_e^i + (1-T)(k_e^i - k_d)\frac{V_d}{V_e}$$

Or rearranged

$$k_e + (1-T)k_d\left(\frac{V_d}{V_e}\right) = k_e^i + (1-T)k_e^i\left(\frac{V_d}{V_e}\right)$$

### The Capital Asset Pricing Model

$$E(r_i) = R_f + \beta_i(E(r_m) - R_f)$$

### The asset beta formula

$$\beta_a = \left[\frac{V_e}{(V_e + V_d(1-T))}\beta_e\right] + \left[\frac{V_d(1-T)}{(V_e + V_d(1-T))}\beta_d\right]$$

### The Growth Model

$$P_o = \frac{D_o(1+g)}{(r_e - g)}$$

### Gordon's growth approximation

$$g = br_e$$

### The weighted average cost of capital

$$WACC = \left[\frac{V_e}{V_e + V_d}\right]k_e + \left[\frac{V_d}{V_e + V_d}\right]k_d(1-T)$$

### The Fisher formula

$$(1+i) = (1+r)(1+h)$$

### Purchasing power parity and interest rate parity

$$S_1 = S_0 x \frac{(1+h_c)}{(1+h_b)} \qquad F_0 = S_0 x \frac{(1+i_c)}{(1+i_b)}$$

**Modified Internal Rate of Return**

$$MIRR = \left[\frac{PV_R}{PV_I}\right]^{\frac{1}{n}} (1 + r_e) - 1$$

**The Black-Scholes option pricing model**

$$c = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

**Present Value Table**

Present value of 1 i.e. $(1 + r)^{-n}$

Where r = discount rate
n = number of periods until payment

*Discount rate (r)*

| *Periods* (n) | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0·990 | 0·980 | 0·971 | 0·962 | 0·952 | 0·943 | 0·935 | 0·926 | 0·917 | 0·909 | 1 |
| 2 | 0·980 | 0·961 | 0·943 | 0·925 | 0·907 | 0·890 | 0·873 | 0·857 | 0·842 | 0·826 | 2 |
| 3 | 0·971 | 0·942 | 0·915 | 0·889 | 0·864 | 0·840 | 0·816 | 0·794 | 0·772 | 0·751 | 3 |
| 4 | 0·961 | 0·924 | 0·888 | 0·855 | 0·823 | 0·792 | 0·763 | 0·735 | 0·708 | 0·683 | 4 |
| 5 | 0·951 | 0·906 | 0·863 | 0·822 | 0·784 | 0·747 | 0·713 | 0·681 | 0·650 | 0·621 | 5 |
| 6 | 0·942 | 0·888 | 0·837 | 0·790 | 0·746 | 0·705 | 0·666 | 0·630 | 0·596 | 0·564 | 6 |
| 7 | 0·933 | 0·871 | 0·813 | 0·760 | 0·711 | 0·665 | 0·623 | 0·583 | 0·547 | 0·513 | 7 |
| 8 | 0·923 | 0·853 | 0·789 | 0·731 | 0·677 | 0·627 | 0·582 | 0·540 | 0·502 | 0·467 | 8 |
| 9 | 0·914 | 0·837 | 0·766 | 0·703 | 0·645 | 0·592 | 0·544 | 0·500 | 0·460 | 0·424 | 9 |
| 10 | 0·905 | 0·820 | 0·744 | 0·676 | 0·614 | 0·558 | 0·508 | 0·463 | 0·422 | 0·386 | 10 |
| 11 | 0·896 | 0·804 | 0·722 | 0·650 | 0·585 | 0·527 | 0·475 | 0·429 | 0·388 | 0·350 | 11 |
| 12 | 0·887 | 0·788 | 0·701 | 0·625 | 0·557 | 0·497 | 0·444 | 0·397 | 0·356 | 0·319 | 12 |
| 13 | 0·879 | 0·773 | 0·681 | 0·601 | 0·530 | 0·469 | 0·415 | 0·368 | 0·326 | 0·290 | 13 |
| 14 | 0·870 | 0·758 | 0·661 | 0·577 | 0·505 | 0·442 | 0·388 | 0·340 | 0·299 | 0·263 | 14 |
| 15 | 0·861 | 0·743 | 0·642 | 0·555 | 0·481 | 0·417 | 0·362 | 0·315 | 0·275 | 0·239 | 15 |

| (n) | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0·901 | 0·893 | 0·885 | 0·877 | 0·870 | 0·862 | 0·855 | 0·847 | 0·840 | 0·833 | 1 |
| 2 | 0·812 | 0·797 | 0·783 | 0·769 | 0·756 | 0·743 | 0·731 | 0·718 | 0·706 | 0·694 | 2 |
| 3 | 0·731 | 0·712 | 0·693 | 0·675 | 0·658 | 0·641 | 0·624 | 0·609 | 0·593 | 0·579 | 3 |
| 4 | 0·659 | 0·636 | 0·613 | 0·592 | 0·572 | 0·552 | 0·534 | 0·516 | 0·499 | 0·482 | 4 |
| 5 | 0·593 | 0·567 | 0·543 | 0·519 | 0·497 | 0·476 | 0·456 | 0·437 | 0·419 | 0·402 | 5 |
| 6 | 0·535 | 0·507 | 0·480 | 0·456 | 0·432 | 0·410 | 0·390 | 0·370 | 0·352 | 0·335 | 6 |
| 7 | 0·482 | 0·452 | 0·425 | 0·400 | 0·376 | 0·354 | 0·333 | 0·314 | 0·296 | 0·279 | 7 |
| 8 | 0·434 | 0·404 | 0·376 | 0·351 | 0·327 | 0·305 | 0·285 | 0·266 | 0·249 | 0·233 | 8 |
| 9 | 0·391 | 0·361 | 0·333 | 0·308 | 0·284 | 0·263 | 0·243 | 0·225 | 0·209 | 0·194 | 9 |
| 10 | 0·352 | 0·322 | 0·295 | 0·270 | 0·247 | 0·227 | 0·208 | 0·191 | 0·176 | 0·162 | 10 |
| 11 | 0·317 | 0·287 | 0·261 | 0·237 | 0·215 | 0·195 | 0·178 | 0·162 | 0·148 | 0·135 | 11 |
| 12 | 0·286 | 0·257 | 0·231 | 0·208 | 0·187 | 0·168 | 0·152 | 0·137 | 0·124 | 0·112 | 12 |
| 13 | 0·258 | 0·229 | 0·204 | 0·182 | 0·163 | 0·145 | 0·130 | 0·116 | 0·104 | 0·093 | 13 |
| 14 | 0·232 | 0·205 | 0·181 | 0·160 | 0·141 | 0·125 | 0·111 | 0·099 | 0·088 | 0·078 | 14 |
| 15 | 0·209 | 0·183 | 0·160 | 0·140 | 0·123 | 0·108 | 0·095 | 0·084 | 0·074 | 0·065 | 15 |

**Annuity Table**

Present value of an annuity of 1 i.e. $\frac{1-(1+r)^{-n}}{r}$

Where r = discount rate
n = number of periods

*Discount rate (r)*

| *Periods* (n) | 1% | 2% | 3% | 4% | 5% | 6% | 7% | 8% | 9% | 10% | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0·990 | 0·980 | 0·971 | 0·962 | 0·952 | 0·943 | 0·935 | 0·926 | 0·917 | 0·909 | 1 |
| 2 | 1·970 | 1·942 | 1·913 | 1·886 | 1·859 | 1·833 | 1·808 | 1·783 | 1·759 | 1·736 | 2 |
| 3 | 2·941 | 2·884 | 2·829 | 2·775 | 2·723 | 2·673 | 2·624 | 2·577 | 2·531 | 2·487 | 3 |
| 4 | 3·902 | 3·808 | 3·717 | 3·630 | 3·546 | 3·465 | 3·387 | 3·312 | 3·240 | 3·170 | 4 |
| 5 | 4·853 | 4·713 | 4·580 | 4·452 | 4·329 | 4·212 | 4·100 | 3·993 | 3·890 | 3·791 | 5 |
| 6 | 5·795 | 5·601 | 5·417 | 5·242 | 5·076 | 4·917 | 4·767 | 4·623 | 4·486 | 4·355 | 6 |
| 7 | 6·728 | 6·472 | 6·230 | 6·002 | 5·786 | 5·582 | 5·389 | 5·206 | 5·033 | 4·868 | 7 |
| 8 | 7·652 | 7·325 | 7·020 | 6·733 | 6·463 | 6·210 | 5·971 | 5·747 | 5·535 | 5·335 | 8 |
| 9 | 8·566 | 8·162 | 7·786 | 7·435 | 7·108 | 6·802 | 6·515 | 6·247 | 5·995 | 5·759 | 9 |
| 10 | 9·471 | 8·983 | 8·530 | 8·111 | 7·722 | 7·360 | 7·024 | 6·710 | 6·418 | 6·145 | 10 |
| 11 | 10·368 | 9·787 | 9·253 | 8·760 | 8·306 | 7·887 | 7·499 | 7·139 | 6·805 | 6·495 | 11 |
| 12 | 11·255 | 10·575 | 9·954 | 9·385 | 8·863 | 8·384 | 7·943 | 7·536 | 7·161 | 6·814 | 12 |
| 13 | 12·134 | 11·348 | 10·635 | 9·986 | 9·394 | 8·853 | 8·358 | 7·904 | 7·487 | 7·103 | 13 |
| 14 | 13·004 | 12·106 | 11·296 | 10·563 | 9·899 | 9·295 | 8·745 | 8·244 | 7·786 | 7·367 | 14 |
| 15 | 13·865 | 12·849 | 11·938 | 11·118 | 10·380 | 9·712 | 9·108 | 8·559 | 8·061 | 7·606 | 15 |

| (n) | 11% | 12% | 13% | 14% | 15% | 16% | 17% | 18% | 19% | 20% | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0·901 | 0·893 | 0·885 | 0·877 | 0·870 | 0·862 | 0·855 | 0·847 | 0·840 | 0·833 | 1 |
| 2 | 1·713 | 1·690 | 1·668 | 1·647 | 1·626 | 1·605 | 1·585 | 1·566 | 1·547 | 1·528 | 2 |
| 3 | 2·444 | 2·402 | 2·361 | 2·322 | 2·283 | 2·246 | 2·210 | 2·174 | 2·140 | 2·106 | 3 |
| 4 | 3·102 | 3·037 | 2·974 | 2·914 | 2·855 | 2·798 | 2·743 | 2·690 | 2·639 | 2·589 | 4 |
| 5 | 3·696 | 3·605 | 3·517 | 3·433 | 3·352 | 3·274 | 3·199 | 3·127 | 3·058 | 2·991 | 5 |
| 6 | 4·231 | 4·111 | 3·998 | 3·889 | 3·784 | 3·685 | 3·589 | 3·498 | 3·410 | 3·326 | 6 |
| 7 | 4·712 | 4·564 | 4·423 | 4·288 | 4·160 | 4·039 | 3·922 | 3·812 | 3·706 | 3·605 | 7 |
| 8 | 5·146 | 4·968 | 4·799 | 4·639 | 4·487 | 4·344 | 4·207 | 4·078 | 3·954 | 3·837 | 8 |
| 9 | 5·537 | 5·328 | 5·132 | 4·946 | 4·772 | 4·607 | 4·451 | 4·303 | 4·163 | 4·031 | 9 |
| 10 | 5·889 | 5·650 | 5·426 | 5·216 | 5·019 | 4·833 | 4·659 | 4·494 | 4·339 | 4·192 | 10 |
| 11 | 6·207 | 5·938 | 5·687 | 5·453 | 5·234 | 5·029 | 4·836 | 4·656 | 4·486 | 4·327 | 11 |
| 12 | 6·492 | 6·194 | 5·918 | 5·660 | 5·421 | 5·197 | 4·988 | 4·793 | 4·611 | 4·439 | 12 |
| 13 | 6·750 | 6·424 | 6·122 | 5·842 | 5·583 | 5·342 | 5·118 | 4·910 | 4·715 | 4·533 | 13 |
| 14 | 6·982 | 6·628 | 6·302 | 6·002 | 5·724 | 5·468 | 5·229 | 5·008 | 4·802 | 4·611 | 14 |
| 15 | 7·191 | 6·811 | 6·462 | 6·142 | 5·847 | 5·575 | 5·324 | 5·092 | 4·876 | 4·675 | 15 |

# FINANCIAL MATHAMATICS

## DISCOUNTING

### a) Perpetual cash flows commencing in year 1

$$\frac{\text{Cash flow}}{\text{Discount rate}}$$

*Example 1*: $5,000 to be paid in perpetuity at a rate of 10%

### b) Perpetual cash flows commencing sometime in future (delayed perpetuity)

$$\frac{\text{Cash flow}}{\text{Discount rate}} \times \text{PV factor for } \textit{year before} \text{ start of perpetuity}$$

*Example 2*:

$5,000 to be received in perpetuity commencing in year 6 discount rate 10%

## c) Annuity starting sometime in future (delayed annuity)

Annuity factor to last year – annuity factor to *year before* start of annuity

Or

No of periods (years) x PV factor of year before start of annuity.

*Example 3*: Annuity of $20,000 p.a. from year 8 to year 15

## d) Cash flows beyond year 15

Use formula $\frac{1 - (1 + r)^{-n}}{r}$

*Example 4*: cash flows 1 – 25 years $10,000 p.a. discount rate 10%

## e) Cash flows growing at a constant rate

$\frac{CFi}{k - g}$

OR

$\frac{CFo\ (1 + g)}{k - g}$

where: CFi = cash flow in year 1

CFo = cash flow just received

k = cost of capital

g = growth rate

*Example 5*:

$10,000 year 1, thereafter increasing by 5%, discount rate 15%

*Example 6*: Suppose cash flows are as follows:

| Yr | CF |
|---|---|
| 0 | (500) |
| 1 -5 | 120 |

Thereafter cash flows growing at 3% p.a. Discount rate is 12%

Calculate NPV