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HKICPA QP Module B Corporate Financing

Education

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LP-12

Investment appraisal

1. Investment

Key points

Investment is spending with a view to obtaining future benefits. This may be in the long term (capital expenditure) or short term (investment in working capital).

2. The capital budgeting process

Key points

Capital budgeting is the process of identifying, analysing and selecting investment projects whose returns are expected to extend beyond one year.

Key terms

Capital rationing is where budget limits or constraints are imposed on the availability of finance.

Budget limits or constraints might be imposed internally or externally.

- (1) The imposition of internal constraints, which are often imposed when managerial resources are limited, is known as **soft capital rationing**.
- (2) **Hard capital rationing** occurs when external limits are set, perhaps because of scarcity of financing, high financing costs or restrictions on the amount of external financing an organisation can seek.

Steps in project appraisal

- Origination of proposals
- Project screening
- Analysis and acceptance
- Monitoring and review

3. Relevant cash flows

Key points

Relevant costs of investment appraisal include opportunity costs, working capital costs and wider costs such as infrastructure and human development costs. **Non-relevant costs** include past costs and committed costs.

Relevant benefits from investments include not only **increased cash flows**, but also **savings** and **better relationships with customers and employees**.

ROCE/ Payback/ IRR/ NPV	<p>1. ROCE (Accounting Rate of Return)</p> <p style="padding-left: 20px;">Estimated average or total profit ----- *100% Estimated average or initial Investment</p> <p>2. Payback 回本期 – Only Part of Cashflow, Easy to Understand</p> <p style="padding-left: 20px;">Discounted Payback</p> <p>3. IRR – Internal Rate of Return 内部回报率</p> <p style="padding-left: 20px;">IRR – Nonconventional Cashflow (More IRRs)</p> <p>4. NPV</p> <p style="padding-left: 20px;">NPV – NPV +-> Increase shareholder wealth; It is the best including cost of capital</p>	
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Illustration						
			A	B		
ROCE for Investment	Profit		10	15		
	Capital Employed		100	100		
ROCE for Investment						
<u>Remark</u>						
Payback Period						
	Yr		0	1	2	3
Cashflow			-300	100	200	-500
Payback Period						
<u>Remark</u>						
IRR						
	Yr		0	1	2	
Cashflow			-100	-	121	
IRR						
<u>Remark</u>						
NPV						
	Yr		0	1	2	
Cashflow			-100	200	300	
Cost of Capital		10%				
			-100	$\frac{200}{(1.1)^1}$	$\frac{300}{(1.1)^2}$	
			= -100	181.82	247.93	
NPV			= 329.75			
<u>Remark</u>						

	ROCE	Payback	IRR	NPV
1. Easy to Understand	✓	✓	More Easily understood (Compared with NPV)	X
2. Time Value of Money	X	X	✓	✓
3. Absolute Measure / Relative Measure	Relative (Ignore Size of Investment)	Relative (Ignore Size of Investment)	Relative (Ignore Size of Investment)	Absolute
Advantages	Quick; Simple	C/F; Simple	Commonly used (Compared with NPV)	Best Method; Cost of Capital included
Disadvantages	Accounting Profit – Manipulation;	Ignore part of Cashflow	Multiple IRR if Non-Conventional C/F; Reinvestment Assumption cannot be substantiated	Difficult to estimate the CF & Cost of Capital / Cost of Capital varied

4. The payback period

Key points

The reason why payback should not be used on its own to evaluate capital investments should seem fairly obvious if you look at the figures below for two mutually exclusive projects (this means that only one of them can be undertaken).

	Project P \$'000	Project Q \$'000
Capital investment	60,000	60,000
Profits before depreciation (an approximation of cash flows)		
Year 1	20,000	50,000
Year 2	30,000	20,000
Year 3	40,000	5,000
Year 4	50,000	5,000
Year 5	60,000	5,000

Project P pays back in year 3 (about one quarter of the way through year 3). Project Q pays back half way through year 2. Using payback alone to judge capital investments, project Q would be preferred.

However the returns from project P over its life are much higher than the returns from project Q.

- Project P will earn total profits before depreciation of \$140 million on an investment of \$60 million.
- Project Q will earn total profits before depreciation of only \$25 million on an investment of \$60 million.

Payback Calculation	Yr 0 1 2 3 4
	-100 60 40 30 10
	Payback period = 2 years
	Yr 0 1 2 3 4
	-120 60 40 30 10
	Payback period = 2.x years
	Not yet paid back after 2 years $(120-60-40)=20$.
	So $20/30 = 0.67$ years
	Payback period = 2.67 years

Advantages

- Simple to calculate and understand
- Concentrates on short-term, less risky flows
- Can identify quick cash generators

Disadvantages

- Ignores timing of flows after payback period
- Ignores total project return
- Ignores time value of money
- Arbitrary choice of cut-off

5. The return of capital employed

Key points

Arrow Ltd wants to buy a new item of equipment which will be used to provide a service to customers of the company. Two models of equipment are available, one with a slightly higher capacity and greater reliability than the other. The expected costs and profits of each item are as follows:

	Equipment	
	Item X	Item Y
Capital cost	\$800,000	\$1,500,000
Life	5 years	5 years
Profits before depreciation	\$'000	\$'000
Year 1	500	500
Year 2	500	500
Year 3	300	600
Year 4	200	600
Year 5	100	600
Disposal value	—	—

ROCE is measured as the average annual profit after depreciation, divided by the average carrying amount of the asset. Decide which item of equipment should be selected, if any, if the company's target ROCE is 30%.

Solution

	Equipment	
	Item X \$'000	Item Y \$'000
Total profit over life of equipment:		
Before depreciation	1,600	2,800
After depreciation	800	1,300
Average annual profit after depreciation	160	260
Average investment = (Capital cost + disposal value)/2	400	750
ROCE	40%	34.7%

Advantages

- Quick and simple calculation
- Easy to understand % return
- Looks at entire project life

Disadvantages

- Takes no account of timing
- Based on accounting profits, not cash flows
- Relative, not absolute, measure
- Ignores time value of money
- Takes no account of project length

6. Discounted cash flow (DCF)

Key points

Present value

The cash equivalent now (X) of a sum of money (V) receivable or payable at the end of n time periods.

Discounting provides the formula $X = V/(1+r)^n$, where r is the rate of return.

Perpetuities

An annual constant cash flow forever.

The PV of \$1 pa in perpetuity at $r\% = \$1/r$ (where r is a decimal).

7. NPV and IRR compared

IRR

IRR

- More easily understood
- Can be confused with ROCE
- Ignores relative size of investments
- May be several IRRs if cash flows not conventional

IRR Interpolation																			
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Horizontal Short</td> <td style="width: 50%;">Vertical Short</td> </tr> <tr> <td colspan="2" style="text-align: center;">----- = -----</td> </tr> <tr> <td>Horizontal Long</td> <td>Vertical Long</td> </tr> <tr> <td colspan="2">If 10% discount → NPV 28,250</td> </tr> <tr> <td colspan="2">If 20% discount → NPV -23,150</td> </tr> <tr> <td style="padding-top: 10px;">IRR% - 10%</td> <td style="padding-top: 10px;">28,250</td> </tr> <tr> <td colspan="2" style="text-align: center;">----- = -----</td> </tr> <tr> <td>20% - 10%</td> <td>23,150+28,250</td> </tr> <tr> <td colspan="2" style="padding-top: 10px;">IRR = 15.5%</td> </tr> </table>	Horizontal Short	Vertical Short	----- = -----		Horizontal Long	Vertical Long	If 10% discount → NPV 28,250		If 20% discount → NPV -23,150		IRR% - 10%	28,250	----- = -----		20% - 10%	23,150+28,250	IRR = 15.5%	
Horizontal Short	Vertical Short																		
----- = -----																			
Horizontal Long	Vertical Long																		
If 10% discount → NPV 28,250																			
If 20% discount → NPV -23,150																			
IRR% - 10%	28,250																		
----- = -----																			
20% - 10%	23,150+28,250																		
IRR = 15.5%																			

NPV

NPV

- Simpler to calculate
- Better for ranking mutually exclusive projects
- Easy to incorporate different discount rates
- NPV = expected increase in shareholder value

IRR vs NPV

- (a) When cash flow patterns are conventional both methods give the same accept or reject decision.
- (b) The IRR method is more easily understood.
- (c) NPV is technically superior to IRR and simpler to calculate.
- (d) IRR and accounting ROCE can be confused.
- (e) IRR ignores the relative sizes of investments.
- (f) Where cash flow patterns are non-conventional, there may be several IRRs which decision makers must be aware of to avoid making the wrong decision.
- (g) The NPV method is superior for ranking mutually exclusive projects in order of attractiveness.
- (h) The reinvestment assumption underlying the IRR method cannot be substantiated.
- (i) When discount rates are expected to differ over the life of the project, such variations can be incorporated easily into NPV calculations, but not into IRR calculations.
- (j) Despite the advantages of the NPV method over the IRR method, the IRR method is widely used in practice.

8. Assessment of DCF methods of project appraisal

Standard Format

	Year 0	Year 1	Year 2	Year 3	Year 4	
Sales receipts		X		X		X
Costs		(X)		(X)		(X)
Sales less Costs		X		X		X
Taxation		(X)		(X)	(X)	(X)
Capital	(X)					
Scrap value						X
Working capital	(X)					X
Tax saved – Tax allowances		X		X	X	
	(X)	X		X		X (X)
Discount factors @ Cost of capital (WACC)	X	X	X	X		
Present value	(X)	X		X		X (X)

NPV is the sum of present values

NPV Calculation								
Detailed Illustration								
		0	1	2	3	4	5	
(1) Operating Result	Revenue		100	120	170	200	250	(a)
	Expenses (Excluding Depreciation)		30	40	40	50	80	
	Depreciation		10	10	10	10	10	(b)
			60	70	120	140	160	
	Tax (30%)		18	21	36	42	48	(c)
			42	49	84	98	112	
(2) Add Back Depreciation	Add back Depreciation		10	10	10	10	10	
			52	59	94	108	122	
(3) Capital Expenditure	Investment	-150					40	(d)
(4) Working Capital	Working Capital	-10	-2	-5	-3	-5	25	(e)
CashFlow	CF	-160	50	54	91	103	187	
Discount Rate (13.4%)	Discount Rate		0.881834	0.777632	0.685742	0.604711	0.533255	(f)
PV		-160	44	42	62	62	100	
NPV		150						
		0	1	2	3	4	5	
Alternative	(1) Operating Result	Revenue	100	120	170	200	250	
		Expenses (Excluding Depreciation)	30	40	40	50	80	
			70	80	130	150	170	
		Tax (30%)	21	24	39	45	51	
			49	56	91	105	119	
	(2) Depreciation: Tax Benefit	Depreciation * Tax	3	3	3	3	3	(b)
			52	59	94	108	122	

Remark	Futher Explanation			
(a) Growth starts at Current Year (Year 0) or Year 1				
(b) 2 Depreciation Methods				
Straight Line Method				
Reducing Method	e.g. Reducing Method: Cost 100 Reducing Rate = 40%; Yr 3 only : Balancing Allowance in Yr3			
			Tax Benefit	
		100		
Dep yr1 (40%)		40	12.0	
		60		
Dep yr2 (40%)		24	7.2	
Balancing Allowance		36	10.8	
(c) Tax Paid this year or paid in arrear				
(d) Capital Expenditure				
Yr0 Money In				
Yr5 Residual Value (Must be after tax)				
(e) Working Capital				
Yr0 required for 10% of Yr1 100 of revenue				
Yr1-4 Incremental working capital				
Yr5 released back				
(f) Discount Rate				
e.g Real Rate = 5%; Inflation Rate = 8%				
$(1+i)=(1+r)*(1+h)$				
$(1+i)=(1+5%)(1+8%)$				
$i=13.4%$				
(g) Exchange Rate Changes				
Using Purchasing Power Parity				

NPV	<p>NPV</p> <ul style="list-style-type: none"> -Real or Nominal CF -Tax paid timing -Tax allowable depreciation -Working Capital -Probability -Sunk Cost (e.g. After 2 years, reappraisal the projects) -Opportunity Cost (e.g. Profit foregone) -Post Completion Audit (Independent)
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Constant Growth / Perpetuity / Annuity

No.	Item	Details
T1	Continuous growth after 4 years onwards / starting year 5 Perpetuity Year 4 onwards	<p>Constant Growth</p> <p>1 2 3 4 5 6 101 102 103 120 120(1+0.03) 120(1+0.03)²</p> <p>=></p> <p>1 2 3 4 101 102 103 120 2,060 101 102 103 2,180</p> <p>NPV = 1,802.41</p> <p>Working</p> <p>Calculate separately for Starting after 4 years / at year 5 (say r=9%)</p> <p>5 6 120(1+0.03) 120(1+0.03)²</p> <p>$= \frac{120(1+0.03)}{(0.09-0.03)} = 2,060 \text{ (PV at yr 4)}$</p> <p>*****</p> <p>Perpetuity</p> <p>Year 4 onwards 30.25</p> <p>1 2 3 4 5 6 14 18.5 20.75 30.25 30.25 30.25</p> <p>=></p> <p>1 2 3 14 18.5 20.75 177.94 14 18.5 198.69</p> <p>NPV= 149.54</p> <p>Working</p> <p>Calculate separately for Starting at year 4 (say r=17%)</p> <p>4 5 6 30.25 30.25 30.25</p> <p>$= \frac{30.25}{(0.17)} = 177.94 \text{ (PV at yr 3)}$</p>

T2	Annuity	<p><u>Loan: Each Year Payment</u></p> <p>0 1 2 3 4 10 +1000 -X -X - X r=4%</p> $1000 = \frac{X}{(1 + 4\%)} + \frac{X}{(1 + 4\%)^2} + \dots + \frac{X}{(1 + 4\%)^{10}}$ $1000 = \left(\frac{1}{(1 + 4\%)} + \frac{1}{(1 + 4\%)^2} + \dots + \frac{1}{(1 + 4\%)^{10}} \right) X$ <p>Using 1: Annuity Formula = $\frac{1 - ((1+r)^{-n})}{r} = 8.1109$; $X = 1000/8.1109 = 123.29$</p> <p>2: Find the annuity using CF -> Annuity = 8.1109</p> <p>3: Annuity Table = 8.111</p> <p>4: [2nd] CLR TVM (Setting END) PV=1000; I/Y = 4; FV=0; N= 10; CPT PMT = 123.29</p>
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9. Allowing for inflation

Nominal vs Real

The relationship between real and nominal rates of interest is given by the Fisher formula:

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

Where: i = rate of inflation

r = real rate of interest

n = nominal (money) rate of interest

Example: Nominal flows and nominal rate

The cash flows given in the example (Inflation 1) above are expressed in terms of the actual number of dollars that will be received or paid at the relevant dates (nominal cash flows). We should, therefore, discount them using the nominal rate of return:

Time	Cash flow \$'000	Discount factor @ 20%	PV \$'000
0	(15,000)	1.000	(15,000)
1	9,000	0.833	7,497
2	8,000	0.694	5,552
3	7,000	0.579	4,053
			<u>2,102</u>

The project has a positive net present value of \$2,102.

Example: Real flows and real rate

Alternatively the 10% inflation can be removed from the future cash flows in order to state them in current or real terms:

Time	Cash flow \$'000	Removing inflation	Real cashflow \$'000
0	(15,000)	1.000	(15,000)
1	9,000	$9,000 \times \frac{1}{1.10}$	8,182
2	8,000	$8,000 \times \frac{1}{1.10^2}$	6,612
3	7,000	$7,000 \times \frac{1}{1.10^3}$	5,259

The cash flows expressed in terms of the value of the dollar at time 0 (real cash flows) can now be discounted using the real rate of 9.1% (calculated earlier in example (Inflation 1)).

Time	Cash flow \$'000	Real discount rate	Real cash flow \$'000
0	(15,000)	1.000	(15,000)
1	8,182	$\frac{1}{1.091}$	7,500
2	6,612	$\frac{1}{1.091^2}$	5,555
3	5,259	$\frac{1}{1.091^3}$	4,050
NPV			<u>2,105</u>

[6th Edition]**Example****Self-test question 1**

QPR Limited is considering undertaking an investment in an infrastructure project to build a bridge in a country where inflation is currently running at 12% and the currency is the florin (FL). The project is expected to take four years and QPR expects to invest FL250,000 at the beginning of the project, the project is expected to require further investment at the beginning of each subsequent year, this amount is expected to reduce by 10% per annum in real terms. At the end of the project QPR expects to receive payment for the bridge of FL2 million. QPR uses a discount rate of 16% to appraise infrastructure investments.

Required

Calculate the present value to QPR of undertaking this project.

Answer 1

Time	Cash flow FL'000	Discount factor	Present value FL'000
0	(250) ^a	1	(250)
1	250,000 x 90% = (225) ^a	1/1.036	(217.2)
2	225 x 90% = (202.5) ^a	1/1.036 ²	(188.7)
3	202.5 x 90% = (182.3) ^a	1/1.036 ³	(164.0)
4	2,000	1/1.16 ⁴	1,104.6
Total			284.7

- (a) The costs of the project occur at the beginning of each year, i.e. time 0,1,2,3 and the company has forecast these costs in real terms and therefore we should apply a real discount rate of $(1.16/1.12 - 1) = 3.6\%$.
- (b) The revenue to be received at the end of the project is stated in nominal terms hence in this case we use the nominal discount rate of 16%.

Note. There are several alternative ways that the present value of this project could be calculated to give an equivalent result. For example the inflation rate could be applied to the real cash outflows to arrive at nominal outflow, which would then be discounted at the nominal discount rate (16%).

10. Allowing for taxation

Tax Payment Timing

- Now
- Payable one year in arrears

Tax allowable depreciation

Example: Taxation

A company is considering whether or not to purchase an item of machinery costing \$400,000 payable immediately. It would have a life of four years, after which it would be sold for \$50,000. The machinery would create annual cost savings of \$140,000.

The company pays tax one year in arrears at an annual rate of 16.5% and can claim tax-allowable depreciation on a 25% reducing balance basis. A balancing allowance is claimed in the final year of operation. The company's cost of capital is 8%.

Should the machinery be purchased?

Solution

Year		Tax-allowable depreciation \$	Year		Tax benefits (cash flow) \$
1	$400,000 \times 0.25$	100,000	2	$100,000 \times 0.165$	16,500
2	$100,000 \times 0.75$	75,000	3	$75,000 \times 0.165$	12,375
3	$75,000 \times 0.75$	56,250	4	$56,250 \times 0.165$	9,281
		<u>231,250</u>			
	Total allowance (400,000 – 50,000)	350,000			
4	Balancing amount	<u>118,750</u>	5	$118,750 \times 0.165$	19,594

There are extra tax payments on annual cost savings of $\$140,000 = 0.165 \times 140,000 = \$23,100$

Calculation of NPV

	\$ Year 0	\$ Year 1	\$ Year 2	\$ Year 3	\$ Year 4	\$ Year 5
Machine costs	(400,000)				50,000	
Cost savings		140,000	140,000	140,000	140,000	
Tax on cost saving			(23,100)	(23,100)	(23,100)	(23,100)
Tax benefits from tax allowance			16,500	12,375	9,281	19,594
After-tax cash flow	(400,000)	140,000	133,400	129,275	176,181	(3,506)
Discount factor @ 8%	1.000	0.926	0.857	0.794	0.735	0.681
Present values	(400,000)	129,640	114,324	102,644	129,493	(2,388)

The net present value is \$73,713 and so the purchase appears to be worthwhile.

11. Working capital

Working capital

- Required at Yr0
- % of Sales (Incremental)
- Released at year end of the project

Example: Working capital

Elsie Ltd is considering the manufacture of a new product which would involve the use of both a new machine (costing \$1,500,000) and an existing machine, which cost \$800,000 two years ago and has a current carrying amount of \$600,000. There is sufficient capacity on this machine, which has so far been under-used.

Annual sales of the product would be 5,000 units, selling at \$320 a unit. Unit costs would be as follows:

	\$
Direct labour (4 hours at \$20)	80
Direct materials	70
Fixed costs including depreciation	90
	<u>240</u>

The project would have a five-year life, after which the new machine would have a net residual value of \$100,000. Because direct labour is continually in short supply, labour resources would have to be diverted from other work which currently earns a contribution of \$15 per direct labour hour. The fixed overhead absorption rate would be \$22.50 an hour (\$90 a unit) but actual expenditure on fixed overhead would not alter.

Working capital requirements would be \$100,000 in the first year, rising to \$150,000 in the second year and remaining at this level until the end of the project, when it will all be recovered. The company's cost of capital is 20%. Ignoring taxation, is the project worthwhile?

Solution

	Years 1–5
	\$
Contribution from new product (5,000 units × \$(320 – 150))	850,000
Less: contribution foregone: (5,000 × (4 × \$15))	<u>300,000</u>
	<u>550,000</u>

	Year 0	Year 1	Years 1–5	Year 5
	\$	\$	\$	\$
Contribution			550,000	
Equipment	(1,500,000)			100,000
Working capital	<u>(100,000)</u>	<u>(50,000)</u>		<u>150,000</u>
Net cash flows	<u>(1,600,000)</u>	<u>(50,000)</u>	<u>550,000</u>	<u>250,000</u>
Discount factor @ 20%	1.000	0.833	*2.991	0.402
Present value	(1,600,000)	(41,650)	1,645,050	100,500
NPV		+103,900		

The NPV is positive and the project is worthwhile.

* The discount factor 2.991 applied to the annual contribution is an example of an annuity factor, which can be used for a series of equal annual cash flows starting at time 0. Annuity factors may be found from the table or from the formula, both given in the Appendix at the end of this Learning Pack.

12. Impact of cost of capital on investments

Key points

The lower a company's WACC, the higher the NPV of its future cash flows and the higher its market value.

13. Risk and uncertainty

Sensitivity analysis

Key term

Sensitivity analysis assesses how responsive the project's NPV is to changes in the variables used to calculate that NPV.

$$\text{Sensitivity} = \frac{\text{NPV}}{\text{Present value of project variable}} \%$$

Example: Sensitivity analysis

Kenney Ltd is considering a project with the following cash flows:

Year	Initial investment \$'000	Variable costs \$'000	Cash inflows \$'000	Net cash flows \$'000
0	7,000			
1		(2,000)	6,500	4,500
2		(2,000)	6,500	4,500

Cash flows arise from selling 650,000 units at \$10 per unit. Kenney Ltd has a cost of capital of 8%.

What is the sensitivity of the project to changes in variables?

Solution

The PVs of the cash flow are as follows:

Year	Discount factor @ 8%	PV of initial investment \$'000	PV of variable costs \$'000	PV of cash inflows \$'000	PV of net cash flow \$'000
0	1.000	(7,000)			(7,000)
1	0.926		(1,852)	6,019	4,167
2	0.857		(1,714)	5,571	3,857
		<u>(7,000)</u>	<u>(3,566)</u>	<u>11,590</u>	<u>1,024</u>

The project has a positive NPV and would appear to be worthwhile. The sensitivity of each project variable is as follows:

$$\text{Initial investment sensitivity} = \frac{1,024}{7,000} \times 100\% = 14.6\%$$

$$\text{Sales volume sensitivity} = \frac{1,024}{11,590 - 3,566} \times 100\% = 12.8\%$$

$$\text{Selling price sensitivity} = \frac{1,024}{11,590} \times 100\% = 8.8\%$$

$$\text{Variable costs sensitivity} = \frac{1,024}{3,566} \times 100\% = 28.7\%$$

Cost of capital sensitivity: need to calculate the IRR of the project:

Year	Net cash flow \$'000	Discount factor @ 15%	PV \$'000	Discount factor @ 20%	PV \$'000
0	(7,000)	1.000	(7,000)	1.000	(7,000)
1	4,500	0.870	3,915	0.833	3,749
2	4,500	0.756	3,402	0.694	3,123
NPV			<u>317</u>		<u>(128)</u>

$$\text{The IRR} \approx 15 + \left(\left(\frac{317}{317 + 128} \right) (20 - 15) \right) \% = 18.56\%$$

$$\text{The cost of capital sensitivity} = \frac{18.56\%}{8\%} \times 100\% = 232\%$$

It can therefore increase by 232% before the NPV becomes negative.

Profitability analysis

A **probability analysis** of expected cash flows can often be estimated and used both to calculate an expected NPV and to measure risk.

Simulation

Simulation will overcome problems of having a very large number of possible outcomes, also the correlation of cash flows (a project which is successful in its early years is more likely to be successful in its later years).

Adjusted payback

The payback method of investment appraisal recognises uncertainty in investment decisions by focusing on the near future. Short-term projects are preferred to long-term projects and liquidity is emphasised.

Adjusted payback uses discounted cash flows.

One way of dealing with risk is to shorten the payback period required. A maximum payback period can be set to reflect the fact that risk increases the longer the time period under consideration. However, the disadvantages of payback as an investment appraisal method mean that adjusted payback cannot be recommended as a method of adjusting for risk.

Risk-adjusted discount rates

Investors want higher returns for higher risk investments. The greater the risk attached to future returns, the greater the risk premium required. Investors also prefer cash now to later and require a higher return for longer time periods.

In investment appraisal, a risk-adjusted discount rate can be used for particular types or risk classes of investment projects to reflect their relative risks. For example, a high discount rate can be used so that a cash flow which occurs quite some time in the future will have less effect on the decision. Alternatively, with the launch of a new product, a higher initial risk premium may be used with a decrease in the discount rate as the product becomes established.

14. Capital rationing

Key points

Capital Rationing	Divisible: Profitability Index NPV (Not Including the capital investment) / PV of Invested Capital (i.e. Normally Yr 0)
	<p>Key term</p> <p>Profitability index is the ratio of the present value of the project's future cash flows (not including the capital investment) divided by the present value of the total capital investment.</p>
	Non-divisible: Trial and Error

Example – Divisible projects

Suppose that Hard Times Ltd is considering four projects, W, X, Y and Z. Relevant details are as follows:

Project	Investment required \$	Present value of cash inflows \$	NPV \$	Profitability index (PI)	Ranking as per NPV	Ranking as per PI
W	(10,000)	11,240	1,240	1.12	3	1
X	(20,000)	20,991	991	1.05	4	4
Y	(30,000)	32,230	2,230	1.07	2	3
Z	(40,000)	43,801	3,801	1.10	1	2

Without capital rationing all four projects would be viable investments. Suppose, however, that only \$60,000 was available for capital investment. Let us look at the resulting NPV if we select projects in the order of ranking per NPV:

Project	Priority	Outlay \$	NPV \$	
Z	1 st	40,000	3,801	
Y (balance)*	2 nd	20,000	1,487	(² / ₃ of \$2,230)
		60,000	5,288	

* Projects are divisible. By spending the balancing \$20,000 on project Y, two-thirds of the full investment would be made to earn two-thirds of the NPV.

Suppose, on the other hand, that we adopt the profitability index approach. The selection of projects will be as follows:

Project	Priority	Outlay \$	NPV \$	
W	1 st	10,000	1,240	
Z	2 nd	40,000	3,801	
Y (balance)	3 rd	10,000	743	(¹ / ₃ of \$2,230)
		60,000	5,784	

By choosing projects according to the PI, the resulting NPV if only \$60,000 is available is increased by \$496.

Example – Indivisible projects

Example: Single period rationing with non-divisible projects

Short Ltd has capital of \$95,000 available for investment in the forthcoming period. The directors decide to consider projects P, Q and R only. They wish to invest only in whole projects, but surplus funds can be invested. Which combination of projects will produce the highest NPV at a cost of capital of 20%?

Project	Investment required \$'000	Present value of inflows @ 20% \$'000
P	40	56.50
Q	50	67.00
R	30	48.80

Solution

The investment combinations are the various possible pairs of projects P, Q and R.

Projects	Required investment \$'000	PV of inflows	NPV from projects \$'000
P and Q	90	123.5	33.50
P and R	70	105.3	35.30
Q and R	80	115.8	35.80

The highest NPV will be achieved by undertaking projects Q and R and investing the unused funds of \$20,000 externally.

15. Qualitative factors

Key points

It is important to realise that in some situations capital expenditure decisions may be approved by management even though the financial computation of the investment's value shows a negative result. This could be due to behavioural, strategic or other qualitative factors.

16. Behavioural implications of capital budgeting

Example

Klinsman Ltd is a decentralised company, which evaluates its divisional managers based on divisional net profit. New projects, if successful, will at some stage improve net profit. Conversely, if new projects fail they will have an adverse effect on the way the managers are evaluated. There are, therefore, strong economic incentives for the managers of these divisions to ensure that new projects are successful. If they succeed bonuses may accrue to them, their reputations will improve, they may be promoted and so on.

What can a manager at Klinsman Ltd do to increase the chance of a project's success in this case mentioned above?

The manager may have two competing projects:

- **Project 1** provides a negative NPV but has a very good effect on net profit for early periods and an adverse effect for later periods.
- **Project 2** has a steady increase in net profit over the project's life and a positive NPV.

We know from our discussion above that the positive NPV project should be accepted because that project increases firm value. However which project do you think the divisional manager might put forward to the Board for consideration? Assuming the divisional manager is a rational person who prefers more wealth to less, has a short-term focus (say three to five years) and is unlikely to suffer adverse consequences by not proposing the positive NPV project, the manager might only put the first project forward.

17. Post-completion audit

Key points

Post-completion audit

A post-completion audit (PCA) measures the success of the project by comparing actual cashflows with projections. It is also used as feedback for future projects.

Main features

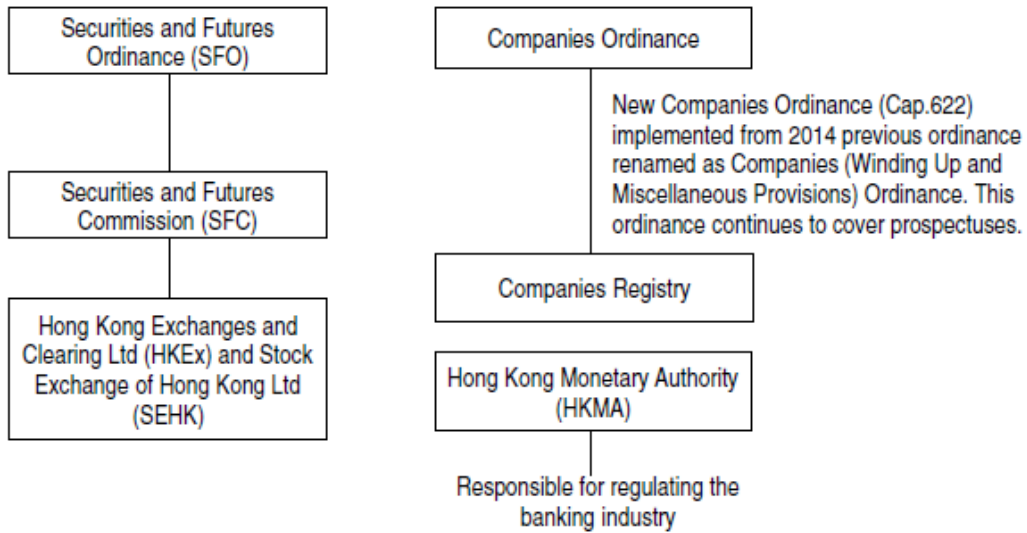
- A PCA should be performed to identify the performance of projects as well as to motivate managers.
- A PCA could be carried out on any project but it is usual to consider the costs and benefits of doing so on smaller projects.
- A PCA should be carried out when sufficient information is available to make a decision (e.g. when the project has stabilised), ideally by an independent person.

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Regulatory environment

1. Legal and regulatory structure and code of conduct affecting corporate finance

Structures



Summary of changes in the new Companies Ordinance

These are

(a) Financial assistance (solvency test)

The new Companies Ordinance which came into operation from 3 March 2014, allows all types of companies (whether listed or unlisted) to provide financial assistance to another party for the purpose of acquiring the company's own shares or the shares of its holding company, subject to a solvency test. Under the previous Companies Ordinance (Cap.32), subject to certain specified exceptions, there was a broad prohibition on the giving of financial assistance to purchase the company's own shares.

(b) Share buy-back (solvency test)

It also allows all types of companies (rather than just private companies, as in the old Companies Ordinance (Cap.32)) to purchase their own shares out of capital, subject to a solvency test.

(c) Schemes of arrangement (headcount test)

Another area of change is that concerning schemes of arrangement, reconstructions or amalgamations of a company with other companies, and compulsory acquisitions.

The 'headcount test' for approving a scheme of arrangement that involves a takeover offer or a general offer to buy-back shares is replaced by a new requirement that the dissenting votes do not exceed 10% of the votes attached to all disinterested shares.

For other schemes, the headcount test is retained, with a new discretion given to the court to dispense with the test for members' schemes in appropriate circumstances.

It also introduces a court-free statutory amalgamation procedure for wholly-owned intra-group companies.

(d) Business Review

The new Companies Ordinance also requires public companies, larger private companies (i.e., companies that do not qualify for simplified reporting) and guarantee companies to prepare a more comprehensive directors' report which includes an analytical and forward-looking 'business review', whilst allowing private companies to opt out by special resolution.

The business review will provide useful information for shareholders. In particular, the requirement to include information relating to environmental and employee matters that have a significant effect on the company, is in line with international trends to promote corporate social responsibility.

(e) Share capital

As mentioned in Chapter 9, the new Companies Ordinance abolished the par value or nominal value of shares. The share premium account is now redundant and any amounts which would previously have been recorded as share premium should now be included in share capital.

2. HKEx regulation and reporting requirements

Key points

- Accountants' report and pro forma financial information
- Continuing obligations to provide reports of interest to investors

HKEx Reporting requirements	<p>There are a large number of reporting requirements in respect of listing on the HKEx. There are two major areas that affect CPAs; (1) the accountants' report and pro forma financial information required in relation to listing, and (2) the continuing obligations to provide reports of interest to investors.</p> <p>(1)</p> <ul style="list-style-type: none"> • All accountants' reports must be prepared by certified public accountants, • A three-year history must be provided which must include the disclosures required under the relevant accounting standards adopted <p>(2)</p> <ul style="list-style-type: none"> • By not later than 30 minutes before the opening of SEHK trading, an issuer must advise the Exchange of any changes in the number of shares, e.g. bonus issues, rights issues, etc. • The issuer must submit a monthly return to the SEHK containing such prescribed information as movements in equity securities and debt securities. • The listed issuer must provide an interim report for the first six months of the financial year. This report must comply with certain provisions and be issued no later than three months after the end of the interim six months. • The issuer must publish its preliminary annual results as soon as possible after the end of the financial year, and no later than three months after the end of the financial year.
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3. Corporate governance

Capital Structure Theories

Corporate governance issues	Separation of Chairman and CEO Board composition Remuneration Internal controls
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Aspects of governance covered by Listing Rules or Corporate Governance Code	Examples of Rules, Code provisions
Directors	<ul style="list-style-type: none"> ▪ Separation of chairman and CEO ▪ At least one-third of board to be independent non-executive directors
Remuneration	<ul style="list-style-type: none"> ▪ Companies must have a remuneration committee of the board with majority of independent NEDS
Accountability and audit	<ul style="list-style-type: none"> ▪ Auditors cannot be removed from office before AGM without shareholder approval in general meeting
Delegation by board	<ul style="list-style-type: none"> ▪ Directors may delegate authority but remain responsible ▪ Directors must take an active interest in the company's affairs.
Communication with shareholders	<ul style="list-style-type: none"> ▪ Annual report should include discussion of company's business model (how it creates value) and its strategy for delivery of objectives

Listing Rules	Listing Rules Code Provisions (CP) – “Comply or Explain” Recommended best practices (RBP)
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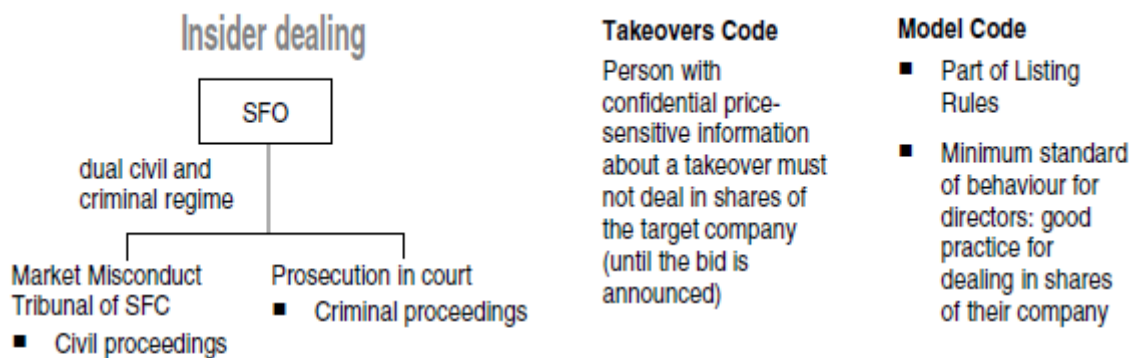
<p>Listing Rules / Code / Recommended Practice (Based on 6th Edition LP)</p>	<p><u>Listing Rule</u></p> <ol style="list-style-type: none"> (1) Director's responsibility, Delegation (May) but remain responsible, (2) Directors must take Active interest in the company's affairs (3) Board - 1/3 Independent Non-executive Director (4) Remuneration Committee– Chaired and Majority (Independent Non-executive Directors) (5) Termination of auditors with the approval of shareholders in a general meeting (6) At least 3 independent non-executive directors, of whom at least one must have appropriate professional qualifications or accounting or related financial management expertise. (7) Listed companies must also establish an audit committee comprising non-executive directors only, with a minimum of three members, and at least one should hold a relevant qualification. (8) The Rules include a requirement for companies to include a Corporate Governance Report in their annual report. [QP (B) 2017 Dec] <p><i>Model Code under Listing Rule</i></p> <ol style="list-style-type: none"> (9) A requirement of the Model Code of the Hong Kong Stock Exchange is that directors must not deal in shares of their company when they are in possession of inside information. In addition, they must not deal in the company's shares in the period 60 days before publication of its annual results or in the period 30 days before publication of its quarterly results (if any) and half-year results. [QP (B) 2017 Dec] <p><u>Codes (Corporate Governance Code, Corporate Finance Advisor Code of Conduct)</u></p> <p><i>Corporate Governance Code</i></p> <ol style="list-style-type: none"> (1) Board review the time required from a director to perform his responsibilities (2) Provide all directors with monthly updates giving a balanced and understandable assessment of the issuer's performance, position and prospects (3) Issuer should have a corporate strategy and a long-term business model (4) Composition of board – A balance of skills, experience and diversity of perspective (5) Separation of chairman and CEO [QP (B) 2017 Dec] (6) Internal Control – Sound and effective internal control to safeguard shareholders' investment <p><i>Corporate Finance Advisor (CFA) Code of Conduct</i></p> <p>Aims: Promote professional and ethical conduct, Set out recommended best practice, Consistent with other regulations and guidelines, Accords with International standards</p> <p>Content: Conduct of business, Competence, Conflicts of interest, Standard of Work, Duties to the client, Communicate with regulators, Personal account dealings</p> <p><u>Recommended Practice</u></p> <p>Details of remuneration payable to members of senior management on an individual and named basis are disclosed in the annual report [QP (B) 2017 Dec]</p>
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4. Insider dealing

Key points

Key term

Insider dealing occurs when an individual who is 'connected' to a listed company has price-sensitive information about the company, and uses this information to deal in the company's shares (or advise someone else to deal in the shares) in order to make a profit or avoid a loss.



Insider dealing (an offence or misconduct) occurs when:

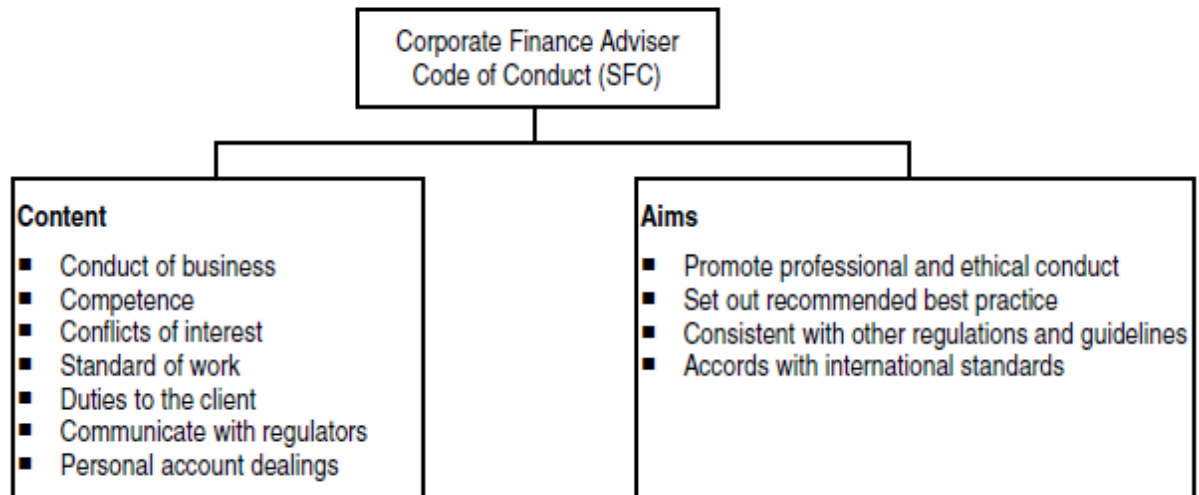
- A person **connected** with a listed company (such as director, employee, advisor substantial shareholder)
- Had **relevant information** (which is not yet known to the public and is likely to affect the share price when made public)
- **Deals** in shares of the company or counsels/procures someone else to deal

An inside dealer can claim an exception to the rule as a defence, but has to prove his claim.

5. Corporate Finance Adviser (CFA) Code of Conduct

Key points

The Securities and Futures Commission (SFC) seeks to promote professional and ethical business conduct among corporate financial advisers in Hong Kong, via the Corporate Finance Adviser Code of Conduct.



6. Listing on the HKEx main board and the GEM

	Listing Rules	Pass one of three financial tests -a profits test (Reported a profit of at least HK\$20,000,000 in its most recent financial year and total reported profits at least HK\$30,000,000 in the two preceding years combined. -a market capitalisation/revenue/cash flow test or -a market capitalisation/revenue test
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Professional advisers

Sponsors

A company that applies for a listing for the first time must appoint one or more sponsors to help with its application. The sponsor must be licensed by the SFC to act as a sponsor. The sponsor acts as the channel of communication between the company and the Listing Division of the SEHK.

It is closely involved in the preparation of the listing document/prospectus and on behalf of the company submits all the documentation for the application for listing. The sponsor is responsible for the accuracy and completeness of the information in the listing document/prospectus and for the compliance of the company's directors with the requirements of the Listing Rules.

Compliance advisers

A newly-listed company must appoint a compliance adviser for the period beginning on the date of the listing of its shares and ending on the publication of its results for the first full financial year that begins after listing. A compliance adviser must be licensed by the SFC to be a sponsor, but need not be the same firm that acted as the company's sponsor for the application for listing.

Underwriters

New issues of shares must usually be fully underwritten. This means that there are investors who have formally agreed to buy any of the shares of the company that are not purchased by other investors. The reason for this rule is that if the share issue is fully underwritten, the company is able to plan on the basis that it will receive the amount of funds it is expecting (and will not raise insufficient money because investors decide not to buy the shares).

Applications for a listing**[Newly Updated with effect from 15 Feb 2018]**

Minimum requirements for listing		
	Main Board	GEM
Type of company	Large and well-established companies that meet the Main Board's requirements.	Small and medium sized companies that meet the GEM's requirements.
Minimum trading record	At least three financial years.	At least two financial years.
Financial requirement	<p>Must pass one of three tests</p> <p>Profits test: Profit of at least HK\$20 million in its most recent financial year and at least HK\$30 million in aggregate in the two preceding years.</p>	<p>Must pass a financial test</p> <ul style="list-style-type: none"> • No profit requirement • Market capitalisation of at least HK\$150 million at the time of listing. • Positive cash flow from operating activities of at least HK\$30 million in aggregate for the two preceding financial years.

	Market capitalisation/ revenue/cash flow test	
	<ul style="list-style-type: none"> • Market capitalisation of at least HK\$2 billion • Revenue of at least HK\$500 million for the most recent audited financial year • Positive cash flow from its operating activities of at least HK\$100 million in total for the most recent three financial years. 	
	Market capitalisation/revenue test	
	<ul style="list-style-type: none"> • Market capitalisation of at least HK\$4 billion • Revenue of at least HK\$500 million for the most recent audited financial year 	
Minimum market capitalisation for shares	See financial requirements – at least HK\$500 million at the time of listing. At least HK\$125 million (25%) to be held by the public.	At least HK\$150 million at the time of listing. At least 25% (subject to a minimum of HK\$45 million) to be held by the public.
Methods of offering shares for a new listed company	Company may not list by means of a placing only.	A mandatory public offering requirement of at least 10% of the total offer size.
Minimum continuity of management	At least the three preceding financial years.	At least the two preceding financial years.
Minimum continuity of ownership	For at least the most recent audited financial year.	For at least the preceding full financial year.
Underwriting requirement	Issue should be fully underwritten.	No underwriting requirement.
Minimum number of shareholders at time of listing who are regarded as the 'public'	300	100

Minimum requirements for listing on the Main board

Not more than 50% of the number of shares held by the public at the time of listing can be beneficially owned by the three largest public shareholders.

Transfer from GEM to the Main Board**Transfers from GEM to the Main Board**

The amendments to Listing Rules also include new arrangements for transfers from GEM to the Main Board.

- The removal of the streamlined process for a transfer of listing from GEM to the Main Board
- The mandatory sponsor requirement, where a sponsor must be appointed at least two months before the submission of a listing application
- The requirement of the issuance of a 'prospectus-standard' listing document

Listing regime for comps from emerging & innovative sectors

- (a) **Permit listings of biotech companies that do not meet any of the Main Board financial eligibility tests**
- (b) **Permit listings of companies with WVR structures**
- (c) **Establish a new secondary listing route for China and international companies that wish to secondary list in Hong Kong**

[6th Edition]

Learning Example

What are the reasons for the Listing Rules containing a provision specifying the minimum amount of shares in public hands and an adequate spread of holders?

The main reason for an exchange to have a rule specifying the minimum number of shares in public hands, (often referred to as the 'free float'), is to ensure that once a company is listed, its shares enjoy a liquid market. This is further strengthened by ensuring that shares are held by a minimum number of individuals.

If the amount of shares in public hands were a very small percentage or shares were only held by a very small number of individuals it would be very unlikely that there would be an active market in those shares, making them difficult to buy or sell, which, after all, is the main function of a stock exchange.

LP-18

Mergers and acquisitions

1. Mergers and acquisitions as a method of corporate expansion

Key points

Organic growth

- The development of internal resources
- Supports **learning** and is supported by it
 - Consistent culture and management style
 - Provides economies of scale
 - Ease of control
- However:
- Can be slow
 - Not good for dealing with barriers to entry

Cooperative methods

Include consortia, **joint ventures**, **licensing**, **franchising** and **sub-contracting**. These methods can enhance access to resources of all kinds, achieve economies of scale, achieve synergy, and enhance competences but stop short of a merger or takeover.

Mergers and acquisitions

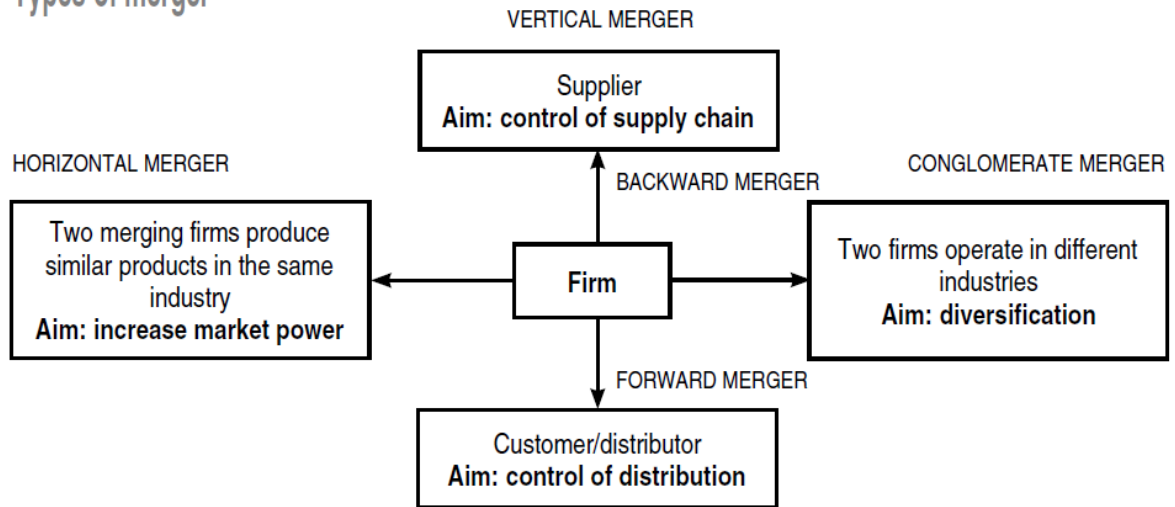
- Can overcome barriers to entry
- Can spread risk
- Can defend against predators
- Provide access to a variety of resources: products; managers; suppliers; production facilities; technology and skills; distribution facilities; cash; tax losses

However, many acquisitions fail to enhance shareholder value.

- Cost: the acquisition price is often too high
- Customers may be disturbed by changes
- Cultural problems, especially in management
- Top management egos can warp judgement
- Professional advisers drive the market

	M&A	<p>M&A</p> <p>Adv: Speed, Lower Cost, Intangible Assets, Overseas Markets</p> <p>Disadv: Business risk, Financial Risk, Acquisition premium (\$), Managerial Incompetence, Integration</p>
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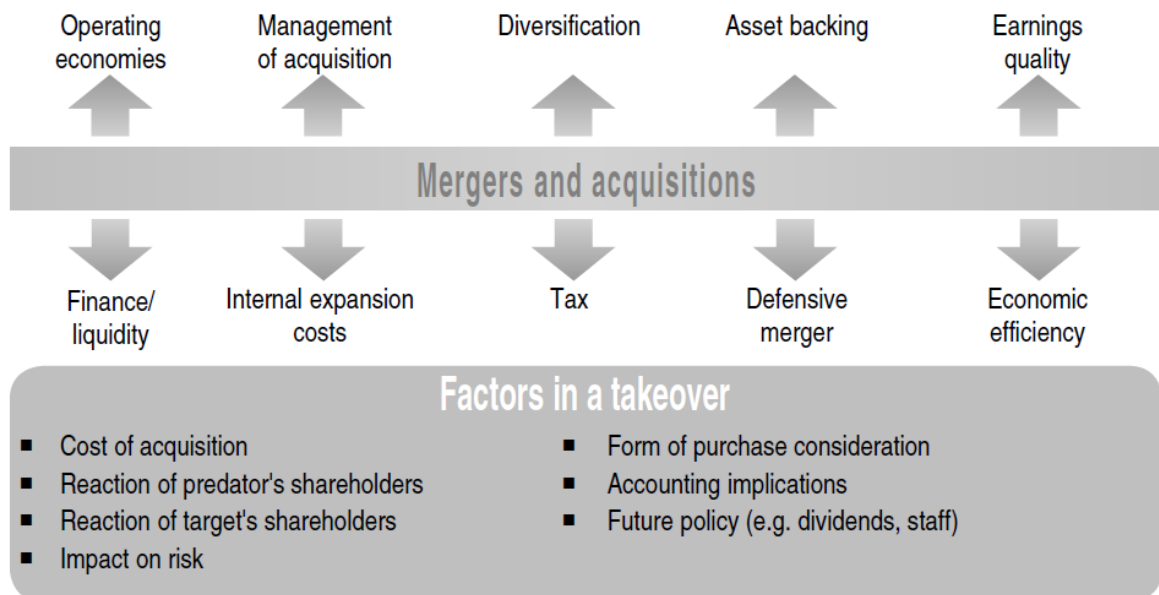
Types of merger



	Merger	<p>Vertical: Supplier</p> <p style="text-align: center;"> </p> <p style="text-align: center;">Co</p> <p>Vertical: Co</p> <p style="text-align: center;"> </p> <p style="text-align: center;">Chain Store</p> <p>Horizontal Integration: e.g. Café De Coral --- Fairwood</p> <p>Conglomerate Integration</p>
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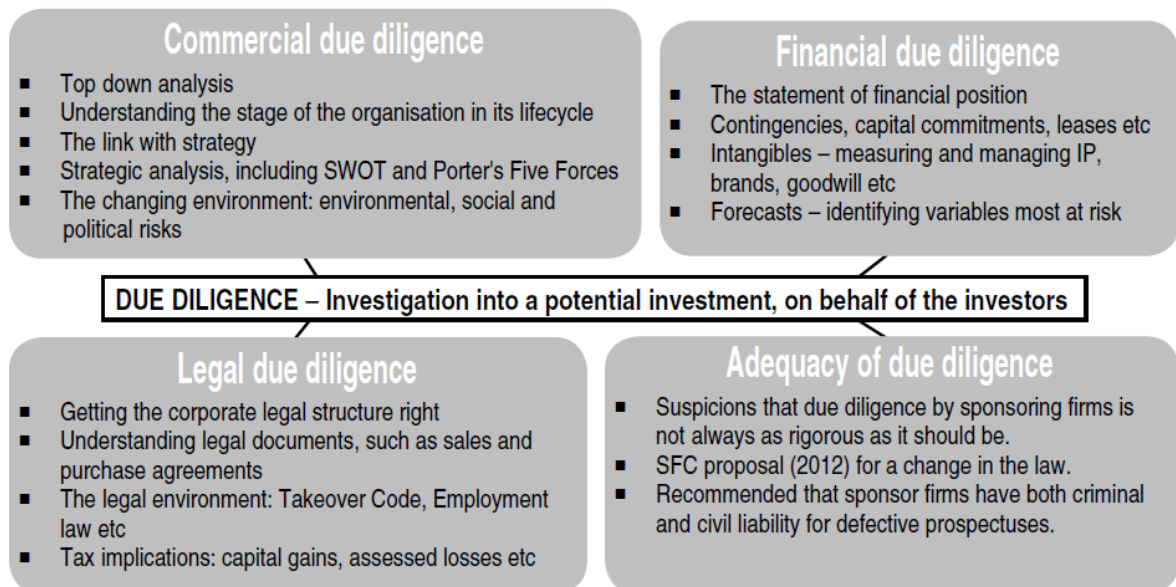
2. Evaluating the corporate and competitive nature of a given acquisition proposal

Key points



3. Due diligence

Key points



4. Developing an acquisition strategy

Key points

Reasons behind a strategy for acquiring a target firm

- Acquire undervalued firms
 - Find firms that are undervalued
 - Access to necessary funds
 - Skills in executing the acquisition

- Diversify to reduce risks

5. Criteria for choosing an appropriate target for acquisition

Key points

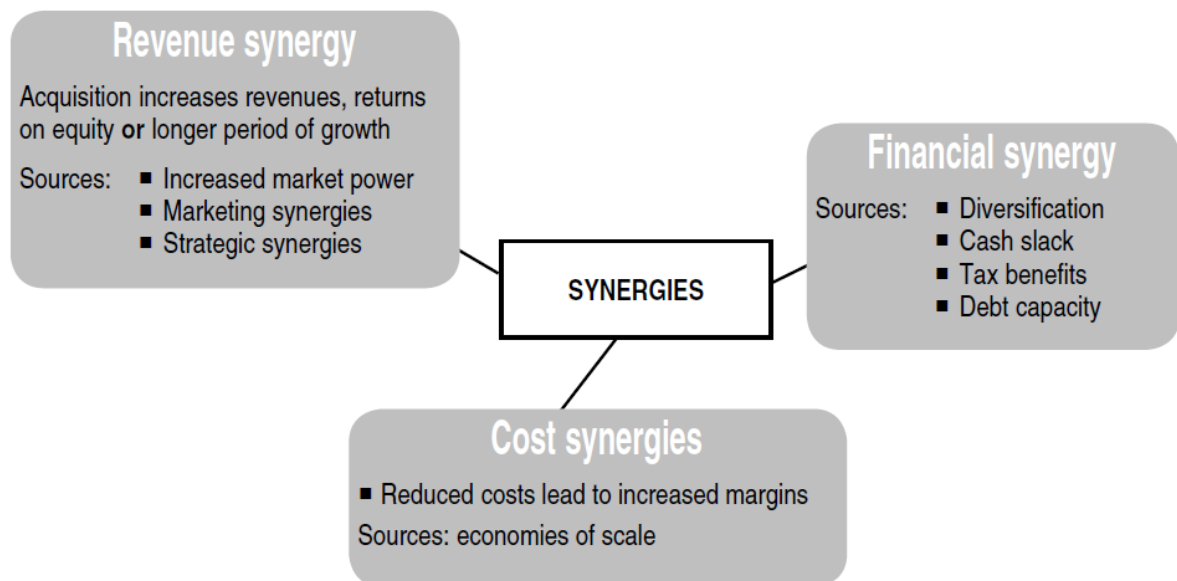
Motives

- Benefit for acquiring undervalued company
- Diversification
- Operating synergy
- Tax savings
- Increase the debt capacity
- Disposal of cash slack
- Access to cash resources
- Control of the company
- Access to key technology

6. Creating synergies

Key points

	Synergy	Synergy – Revenue, Cost (Diversification, Cash slack, Tax benefits and debt capacity) and Financial
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7. Explaining high failure rate of acquisitions in enhancing shareholder value

Key points

A number of theories have been put forward to explain the **high failure rate of acquisitions in enhancing shareholder value**. These include **agency theory**, **errors in valuing a target firm**, **market irrationality** and the **pre-emptive theory**.

window dressing

8. The global regulatory framework

Key points

Takeover regulation seeks to regulate the conflicts of interest between the management and shareholders of both the **target** and the **bidder**.

There are **two main agency problems** that emerge in the context of a takeover that regulation seeks to address:

- (a) The first is the **protection of minority shareholders**. In addition to existing minority shareholders, transfers of control may turn existing majority shareholders of the target into minority shareholders.
- (b) The second is the possibility that the management of the target company may implement **measures to prevent the takeover** even if these are **against stakeholder interests**.

9. Key aspects of takeover regulation

Key points

	Key aspects of takeover regulation	<p>Mandatory bid rule</p> <p>In the UK, for example, this threshold is specified by the City Code for Takeovers and Mergers and is at 30%, which is similar to the Hong Kong requirement.</p> <p>The mandatory-bid rule is based on the grounds that once the bidder obtains control he may exploit his position at the expense of minority shareholders. This is why the mandatory-bid rule normally also specifies the price that is to be paid for the shares.</p> <p>The bidder is normally required to offer to the remaining shareholders a price not lower than the highest price for the shares already acquired during a specified period prior to the bid.</p> <p>The principle of equal treatment</p> <p>Transparency of ownership and control</p> <p>The squeeze-out and sell-out rights</p> <p>Squeeze-out rights gives the bidder who has acquired a specific percentage of the equity (usually 90%) the right to force minority shareholders to sell their shares.</p> <p>Sell-out rights enable minority shareholders to require the majority shareholder to purchase their shares.</p> <p>The one share-one vote principle</p> <p>The effect of the break-through rule, where this is allowed by corporate law, is to enable a bidder with a specified proportion of the company's equity to break-through the company's multiple voting rights and exercise control, as if one share-one vote existed.</p> <p>Board neutrality and anti-takeover measures</p> <p>Seeking to address the agency issue where management may be tempted to act in their own interests at the expense of the interests of the shareholders, several regulatory devices propose board neutrality. For instance, the board would not be permitted to carry out post-bid aggressive defensive tactics (such as selling the company's main assets, known as crown jewels defence, or entering into special arrangements giving rights to existing shareholders to buy shares at a low price, known as poison pill defence), without the prior authority of the shareholders.</p>
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10. Hong Kong specific takeover regulation

Key points

General aims of regulation

- Protection of non-controlling interest and other stakeholders (in HK listed companies)
- Prevent management acting against stakeholder interests
- Ensure a well-functioning market

Hong Kong specific regulation

Code on takeovers and mergers and share buy-backs (issued by SFC in conjunction with Takeovers Panel) set out agreed standards of commercial conduct:

Applies to:

- Offers for all relevant companies
- Takeovers and mergers of all relevant companies
- All transactions, including share buy-backs by general offer

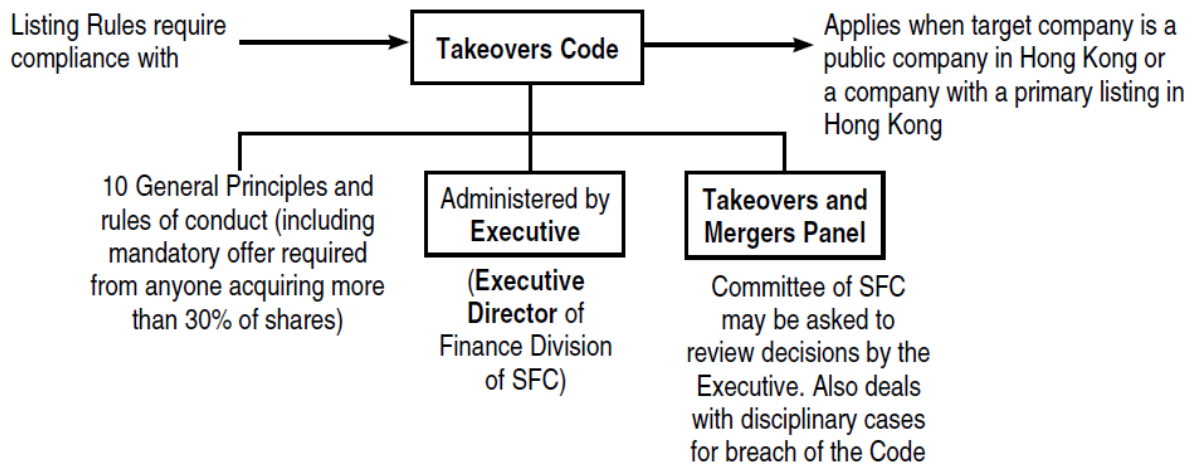
Sets out ten (non-statutory) general principles

Key aspects of takeover regulation

- Mandatory-bid rule (if a person acquires more than 30% of shares)
- Principle of equal treatment
- Transparency of ownership and control
- Squeeze-out and sell-out rights
- One share-one vote principle
- Break-through rule
- Board neutrality and anti-takeover measures

Four primary objectives of Codes:

- Ensure equality of treatment for shareholders affected by takeovers, mergers and share buy-backs
- Ensure provision of adequate information to enable shareholders to make an informed decision on a potential offer
- Ensure there is a fair and informed market in the shares of companies affected by takeovers, mergers and share buy-backs
- Provide a framework within which takeovers, mergers and share buy-backs are conducted



	Hong Kong Specific takeover regulation -Purpose	<ul style="list-style-type: none"> • Require equality of treatment for shareholders • Require disclosure of timely and adequate information to enable shareholders to make a decision as to the merit of an offer • Ensure that there is a fair and informed market in the shares of the companies affected. <p>The Codes do not have the force of law, but their general principles and rules are applied by the Executive and Takeover Panel when making rulings about a takeover or merger. The Stock Exchange Listing Rules expressly require compliance with the Codes. Anyone who breaches the Code risks having the facilities of the Hong Kong financial markets withheld from them.</p>
	Hong Kong Specific takeover regulation -The General Principles	<ol style="list-style-type: none"> 1. All shareholders are treated even-handedly. 2. Control Changes -> General offer 全面收購 to all other shareholders 3. During the course of an offer, neither an offeror nor the offeree company ...may furnish information to some shareholders which is not made available to all shareholders. 4. An offeror should announce an offer only after careful and responsible consideration 5. Shareholders should be given sufficient information. 6. Full and prompt disclosure 7. Right of control should be exercised in good faith. 8. Directors of an offeror and the offeree company must always, act only in their capacity as directors. 9. At no time after a bona fide offer 真實 has been communicated... 10. Cooperation with the Executive, the Panel and the Takeovers and Mergers Appeal Committee
	Hong Kong Specific takeover regulation -Rules of the Codes	<p>On receiving the offer, the board of the offeree company is required, in the interests of the shareholders, to set up a committee of independent non-executive directors which should make a recommendation about whether the offer appears to be fair and reasonable and a recommendation about acceptance. The company should also appoint an independent financial adviser. The recommendation of the independent committee and the written advice of the financial adviser should be included in a circular that the board of the offeree company is required to send to shareholders about the bid.</p> <p>The offeror is required to post an offer document to the shareholders in the offeree company within 21 days of the announcement of the offer. Within the next 14 days, the directors of the offeree company must send a circular to the shareholders, containing information to help them reach a decision (and containing the recommendations of the independent committee and the advice of the financial adviser). If the takeover is 'friendly' the offeror's offer document and the circular of the board of the offeree company should be combined into a single document. All documents must be in English or Chinese, with a translation into Chinese or English. Documents must also be filed with the Executive before they are released or published, and cannot be released or published until the Executive states that it has no further comments to make.</p> <p>Dealings in shares of the offeree company may take place during the offer period. Details of any shares purchased in the market by the offeror must be publicly disclosed. If the offeror buys shares in the offeree company after the public announcement of the offer at a price that is more favourable than the offer price, it must raise its offer price to not less than the highest price paid for any of the shares it has acquired. In addition, the offeror cannot buy shares in the offeree company from some shareholders on more favourable terms than it has offered to other shareholders. These rules are designed to prevent an offeror from offering a better deal to some shareholders than to others.</p> <p>The offer period cannot last longer than 7:00 pm on the 60th day after the offer document was posted. The results of the bid are announced and if acceptances are sufficient, the offer is declared unconditional and the offeror buys the shares of the shareholders who have accepted the offer. If the offeror acquires at least 90% of the shares it is trying to acquire, it has a right of compulsory purchase of the remaining minority still held by other shareholders.</p>

11. Defensive tactics in a hostile takeover

Key points

Defensive Tactics	<p>Pre-bid : Communication w shareholders, Revalue non-current assets, Crown Jewels (Sell Valuable Asset), Poison pill (Existing Shareholder increase share cheap), Change the Article of Association (Super majority), Golden Parachute (\$->Mgt)</p> <p>Post bid : White Knight, Pacman, Competition Rule</p> <p>Golden Parachute (\$\$\$\$\$-> Existing Mgt) Poison Pill (Right: Existing shareholder -> Cheap to buy) White Knights and White Squires (Control vs No Control) Crown Jewels (Sold Valuable Part Out) Pacman Defence Litigation (Target: Invite regulator to stop)</p>
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Tactic	Explanation
Golden parachute	Large compensation payments made to top management of target firm if their positions are eliminated due to hostile takeover. May include cash or bonus payments, stock options or a combination
Poison pill	Attempt to make a company unattractive, normally by giving the right to existing shareholders to buy shares at a very low price
White knights and white squires	Inviting a firm to rescue the target from the unwanted bidder. The white knight would act as a friendly counter-bidder. A white squire is similar but does not take control of the target firm
Crown jewels	Selling the firm's most valuable assets or entering into arrangements such as sale and leaseback, to make it a less attractive target
Pacman defence	Mount a counter-bid for the attacker (an aggressive rather than defensive tactic)
Litigation or regulatory defence	Challenge the acquisition by inviting an investigation by the regulatory authorities or through the courts. May be able to sue for a temporary order to stop the predator from buying any more of its shares

12. Methods of financing mergers

Key points

	M&A	Cash offer vs Share Exchange Acquirer : Consider Dilution of EPS, Cost to the company, Gearing, Control, Authorised share capital increase, Borrowing limits increases Target: Consider Taxation, Income, Future investments and share price
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Purchase consideration



Cash purchases



Share exchange



Convertible loan stock

Choice of offer

Predator's shareholders

- EPS dilution
- Tax allowable interest
- Change in gearing
- Change in effective control

Target's shareholders

- Liability to tax on cash capital gain
- Maintain existing income
- Maintain stake in company
- Want shares to retain value

If cash consideration is used, cash may have to be raised by rights issue or borrowing by medium-term loan or mezzanine finance.

The factors that the directors of the bidding company must consider include the following:

Company and existing shareholders

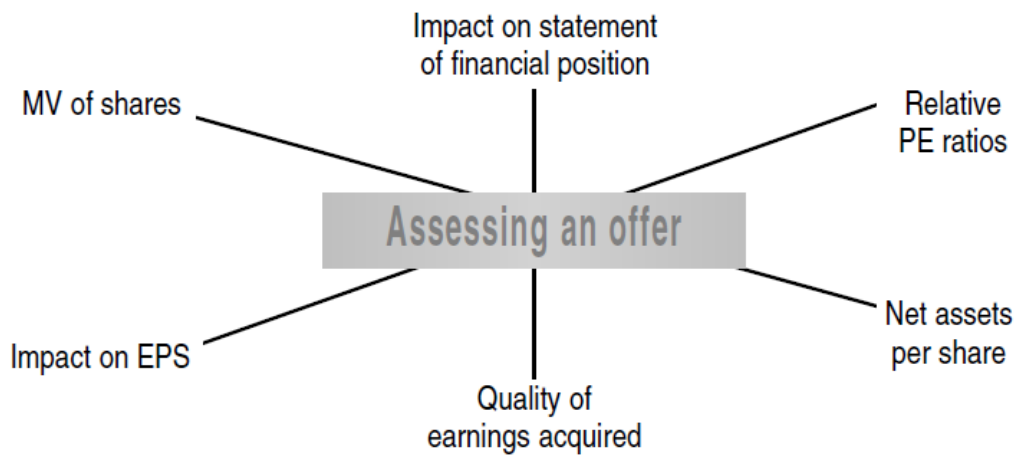
Dilution of EPS	Fall in EPS attributable to existing shareholders may occur if purchase consideration is in equity shares
Cost to the company	Use of loan stock to back cash offer will attract tax relief on interest and have lower cost than equity. Convertible loan stock can have lower coupon rate than ordinary stock
Gearing	Highly geared company may not be able to issue further loan stock to obtain cash for cash offer
Control	Control could change considerably if large number of new shares issued
Authorised share capital increase	May be required if consideration is in form of shares. This will involve calling a general meeting to pass the necessary resolution
Borrowing limits increase	General meeting resolution also required if borrowing limits have to change

Shareholders in target company

Taxation	If consideration is cash, many investors may suffer immediate liability to tax on capital gain
Income	If consideration is not cash, arrangement must mean existing income is maintained, or be compensated by suitable capital gain or reasonable growth expectations
Future investments	Shareholders who want to retain stake in target business may prefer shares
Share price	If consideration is shares, recipients will want to be sure that the shares retain their values

13. Assessing a given offer

Key points



There are circumstances where a dilution of earnings is acceptable if any of the following benefits arise as a result:

- Earnings growth
- Quality of earnings acquired is superior
- Dilution of earnings compensated by an increase in net asset backing

Learning Examples

Giant Inc. takes over Tiddler Co. by offering two shares in Giant for one share in Tiddler. Details about each company are as follows:

	Giant Inc.	Tiddler Co.
Number of shares	2,800,000	100,000
Market value per share	\$4	–
Annual earnings	\$560,000	\$50,000
EPS	20c	50c
P/E ratio	20	

By offering two shares in Giant worth \$4 each for one share in Tiddler, the valuation placed on each Tiddler share is \$8, and with Tiddler's EPS of 50c, this implies that Tiddler would be acquired on a P/E ratio of 16. This is lower than the P/E ratio of Giant, which is 20.

If the acquisition produces no synergy, and there is no growth in the earnings of either Giant or its new subsidiary Tiddler, then the EPS of Giant would still be higher than before, because Tiddler was bought on a lower P/E ratio. The combined group's results would be as follows:

	Giant group
Number of shares (2,800,000 + 200,000)	3,000,000
Annual earnings (560,000 + 50,000)	610,000
EPS	20.33c

If the P/E ratio is still 20, the market value per share would be \$4.07 (20.33×20), which is 7c more than the pre-takeover price.

The process of buying a company with a lower P/E ratio in order to boost your own EPS is sometimes called **bootstrapping**. Whether the stock market is fooled by this process is debatable. The P/E ratio is likely to fall after the takeover in the absence of synergistic or other gains.

Intangible Inc. has an issued capital of 2,000,000 ordinary shares. Net assets (excluding goodwill) are \$2,500,000 and annual earnings average \$1,500,000. The company is valued by the stock market on a P/E ratio of 8. Tangible Co. has an issued capital of 1,000,000 ordinary shares. Net assets (excluding goodwill) are \$3,500,000 and annual earnings average \$400,000. The shareholders of Tangible Co. accept an all-equity offer from Intangible Inc. valuing each share in Tangible Co. at \$4.

Required

Calculate Intangible Inc.'s earnings and assets per share before and after the acquisition of Tangible Co..

Answer 1

- (a) Before the acquisition of Tangible Co., the position is as follows:

$$\text{Earnings per share (EPS)} = \frac{\$1,500,000}{2,000,000} = 75\text{c}$$

$$\text{Assets per share (APS)} = \frac{\$2,500,000}{2,000,000} = \$1.25$$

- (b) Tangible Co.'s EPS figure is 40c (
- $\$400,000 \div 1,000,000$
-), and the company is being bought on a multiple of 10 at \$4 per share. As the takeover consideration is being satisfied by shares, Intangible Inc.'s earnings will be diluted because Intangible Inc. is valuing Tangible Co. on a higher multiple of earnings than itself. Intangible Inc. will have to issue 666,667 (
- $4,000,000/6$
-) shares valued at \$6 each (earnings of 75c per share at a multiple of 8) to satisfy the \$4,000,000 consideration. The results for Intangible Inc. will be as follows:

$$\text{EPS} = \frac{\$1,900,000}{2,666,667} = 71.25\text{c} \text{ (3.75c lower than the previous 75c)}$$

$$\text{APS} = \frac{\$6,000,000}{2,666,667} = \$2.25 \text{ (\$1 higher than the previous \$1.25)}$$

If Intangible Inc. is still valued on the stock market on a P/E ratio of 8, the share price should fall by approximately 30c ($8 \times 3.75\text{c}$, the fall in EPS) but because the asset backing

$\left(\frac{\text{Net assets excluding goodwill}}{\text{Shares}} \right)$ has been increased substantially the company will probably

now be valued on a higher P/E ratio than 8.

The shareholders in Tangible Co. would receive 666,667 shares in Intangible Inc. in exchange for their current 1,000,000 shares, that is, two shares in Intangible for every three shares currently held.

- (a)
- Earnings**

	\$
Three shares in Tangible earn ($3 \times 40\text{c}$)	1.200
Two shares in Intangible will earn ($2 \times 71.25\text{c}$)	1.425
Increase in earnings, per three shares held in Tangible	<u>0.225</u>

- (b)
- Assets**

	\$
Three shares in Tangible have an asset backing of ($3 \times \$3.5$)	10.50
Two shares in Intangible will have an asset backing of ($2 \times \$2.25$)	4.50
Loss in asset backing, per three shares held in Tangible	<u>6.00</u>

The shareholders in Tangible Co. would be trading asset backing for an increase in earnings.

14. Effect of offer on financial position and performance

Learning Example

Romer Company will acquire all of the outstanding stock of Dayton Company through an exchange of stock. Romer is offering one of its shares for every two shares in Dayton. Financial information for the two companies is as follows:

	Romer	Dayton
Net income	\$50,000,000	\$12,000,000
Shares outstanding	5,000,000	2,000,000
Earnings per share	\$10.00	\$6.00
Market price of stock	\$150.00	
P/E ratio	15	

Required

- Calculate the number of shares to be issued by Romer.
- Calculate combined EPS after the acquisition, assuming no synergy.
- Calculate the P/E ratio valuation of shares in Dayton
- Compare the P/E ratio valuation of Dayton with the pre-acquisition P/E ratio of Romer
- Calculate maximum price that Romer could pay before dilution of its EPS occurred

(a) Shares to be issued by Romer: 2 million shares in Dayton \times $\frac{1}{2}$ = 1 million shares in Romer.

(b) Combined EPS: $\frac{\$50,000,000 + \$12,000,000}{5,000,000 + 1,000,000} = \10.33

(c) P/E ratio valuation of shares in Dayton: $\frac{\$12,000,000}{1,000,000 \text{ shares}} = 12$

(d) Dayton is acquired on a P/E ratio valuation of 12, which is less than the pre-acquisition P/E ratio of Romer. Consequently the P/E ratio after the acquisition will increase, even without any synergy effect on annual profitability.

(e) Maximum price before dilution of EPS:

There will be no dilution of EPS if Dayton is purchased on a P/E ratio multiple of 15, which is the P/E ratio of Romer before the acquisition (and assuming no synergy effect on post-acquisition profits).

Combined earnings after the acquisition = \$62,000,000

EPS (no change): \$10

Number of shares = \$62,000,000/\$10 per share = 6,200,000

Romer has 5,000,000 shares in issue before the acquisition, and there would be no dilution in EPS if it issued 1,200,000 new shares to acquire Dayton. This would involve a share exchange of 3 new shares in Romer for every 5 shares in Dayton.

15. The role of the financial adviser in mergers and takeovers

Key points

While the SFC Code on Takeovers and Mergers does not have the force of law in Hong Kong, they do have some important provisions regarding the role of financial advisers in mergers and takeovers (M&A).

Among other things, the Code states; 'Financial and other professional advisers must have the competence, professional expertise and adequate resources to fulfil their role and to discharge their responsibility under the Code. If a financial adviser is in any doubt about its ability to meet these requirements, it should consult with the Executive in advance. If the Executive considers that a financial adviser is not able to meet these requirements, it may not allow the adviser to act in that capacity. Financial advisers must also be mindful of conflicts of interest.'