



Teach yourself how to build a Business Case for any industry including mining

1a A preliminary business case can be constructed rapidly!



www.economicevaluation.com.au

Spend only a few seconds on each slide.

This website may contain errors so always check your own work and have it audited by a competent person

Zambia: Luangwa National Park walking safari - pride of lighs above a dead hippo in river just ahead The purpose of this module is to show how a 'preliminary business case' can be constructed rapidly:

- to assess a project or idea
- to assess and value an existing business
- \circ for an acquisition



A preliminary business case for a project can be put together in a few hours using peoples' best ideas of: -

- 1. Market & Revenue: What will be produced and sold over the years ahead
- 2. Capital Costs: How long will it take to design and establish. What will it cost to get into operation?
- 3. Operations: How will the output/benefits be produced and distributed to customers? What will be the operating costs and overheads?
- 4. Taxes: Simplified calculations will suffice OR perhaps omit taxes until the next stage of evaluation.
- 5. Cashflow: The money involved in each of these four streams is added together each month, or each quarter or each year over the life of the project to get net cashflows.

Usually a project will need cash funding to get established and then hopefully 'stand on its own legs' to generate sufficient excess cash to justify itself.

This is all it takes to create a preliminary business case!



Some people call this activity "financial modelling" or "financial analysis".

A preliminary business case to assess and value an <u>existing business</u>

will take somewhat longer but can be done in the same sequence.



A preliminary business case usually only touches on funding and ownership!

- 1. Financing: Preliminary thought can be given to how the project/business would be funded by internal cashflows, loans and equity ... etc but first priority should be to investigate whether it is likely to be an attractive investment in its own right. Is it healthy?
- 2. **Ownership:** Similarly, ownership can be conceptualised without too much analysing of various legal structures.

In most instances, the preliminary business case does not need to work out where the money might come from and who might be the owners. Instead, it simply should assume that there is a ring-fence around the project/business and that the cash to establish it would come from somewhere and that surplus cash generated by the project/ business will go out to somewhere.

 \rightarrow How does it look as a stand alone business?

In this way the <u>preliminary</u> business case evaluates the **economics of the business/project** (cash inputted versus cash generated). **Does it justify further study?**



Be very wary of projects/ideas that rely on 'clever' financing, 'smart' taxation claims or getting an big advantage over other owners to make them attractive. You winning at someone else's expense probably will not last.

Further: -

- **Good study managers are impartial.** They can use the preliminary business case to help decide whether more time and money should be spent on a potential idea/project/business or whether it should be scrapped/put aside.
- Stopping a 'pet project' can take courage: especially if it is being pushed by the boss.
- When an idea/project/business begins to look attractive and is promoted into the next stage of study, it may be appropriate to start exploring different ways of financing the project/business. This may be by a mix of **internal cash flows, loans, new equity** ... etc depending on the magnitude of the project within the company.

Where a project/business would be wholly owned by one company and it is quite small relative to the size of the company, then the project is likely to be funded by **internal cash flows** including normal business borrowings.

- Where a project would be co-owned with another company and/or its cost would stretch finances, then it is OK to start talking about **ownership and legal structures**. But this should be an activity in the background. The primary focus should be on getting a clear understanding of the project's economics in the preliminary business case!
- Some people get absorbed by the possibilities for ownership and financing (which actually is 'financial modelling'). They feel rather special. Their models become enormous and 'sophisticated', with the financing swamping the underlying economics and even infiltrating it like cancer. These people can lose contact with the underlying project/business and make themselves increasingly irrelevant.
- "economic evaluation" is simply cash in versus cash out. Is the project a sound business in its own right regardless of who finances it and who owns it?



A preliminary business case can be created

- 1. on paper using a hand calculator, or
- 2. in an Excel Workbook (spreadsheet) which would be far easier and be far more useful.
 - only basic Excel skills are needed because the business plan must be kept easy-to-follow so others can rapidly understand it.
 "Easy-to-follow" does not mean "simple". It means that anyone could be sent a copy and be able to read through the Excel model as though it were almost a children's story book; even if the plot is complex!

As an illustration this is the heart of an NPV computation. Each Cashstream has been generated by a block of computations: -

Cashflow and NPV											
Cashlows		Total	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9
Cashstream 1: Revenue	A\$ millions real	672	0	0	125	156	156	156	78	0	0
Cashstream 2: Capital Costs	A\$ millions real	154	25	98	6	6	6	6	6	0	0
Cashstream 3: Operating Costs	A\$ millions real	386	0	11	67	78	74	73	39	45	0
Cashstream 4: Taxes	A\$ millions real	67	0	-3	11	21	24	26	1	-14	0
Net Cashflow	A\$ millions real	65	-25	-105	41	51	51	51	32	-32	0
IRR	Real	16.8%									
Discounting											
7Jul20 F Green email: discount rate for investment in gold industry is 8	% Real.										
Discount Rate	% Real		8%	8%	8%	8%	8%	8%	8%	8%	8%
Discount Factor			0.96	0.89	0.82	0.76	0.71	0.65	0.61	0.56	0.52
Discounted Cashflow	A\$ millions real	26	-24	-94	34	39	36	33	20	-18	0
Cumulative NPV	A\$ millions real		-24	-118	-84	-45	-9	24	44	26	26
NPV	A\$ millions real	26									

This Website has several worked examples of business cases in Excel that can be downloaded

- free and without any obligation at www.economicevaluation.com.au



A simple example:

A work group in a factory or mine-site have been talking about a new product that could be recovered from the waste materials.

- 1. One of them offers to do the economic evaluation ("financial model") and convenes a short meeting.
- 2. The work group agrees upon a preliminary plan of how the new product could be produced and what facilities would be required.
- 3. People in the existing operations and in engineering make preliminary estimates of the time that would be needed to complete studies, get approvals, build the new facilities and start production.
- 4. Specialists in marketing make estimates of volumes, prices and logistics for the new product.

Years ->	units	Total	·			· 			·				
Cashstream 1: Production and Revenue			Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	yr8	Yr9	Yr10	X
Production													
3 Nov 2020 Michel Basil: Email of production throughputs and output of Waste removed	000 tonnes	11,000		3,000	3,000	2,500	1,500	1,000	0				
Ore mined Head Grade - acid soluble copper	% Cu	4,300			800 2.1%	1,000	1,000	1,000	500 2.1%				
Contained acid soluble copper	000 tonnes	90	0	0	17	21	21	21	11	0	0	0	
Recovery of soluble copper in processing and SX-EW Output and Sales of Cathode Copper	% Cu 000 tonnes	90% 81	0	0	90% 15	90%	90%	90%	90%	0	0	0	
Sales and Revenue 5 Nov 2020 Peter Murphy: Company paired forecasts of copper price an	d exchange rate												
Copper price - SX-EW cathode Output and Sales of Cathode Copper	US\$/Ib real US\$ millions real	538	3.00	3.00	3.00 100	3.00 125	125	1.00	3.00 63	0	0	0	
Forex AS Cashstream 1: Revenue	A\$1.00 = US\$ A\$ millions real	672	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0	•	0	
Years ->	units	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Cashstream 2: Capital Costs													
Malas Development Cours													
3 Dec 2020 2014 Carlo Embre: Email - Initial capex estimates	Af willing and												
Consider Construction Capital				~									
5 Dec 2020 2014 Carlo Embre: Email - on-going capex @ 5% of total in	tial capex												
ongoing capex	A\$ millions real	31	0	0	6	6	6	6	6	0	0	0	
Cashstream 2: Capital Costs	A\$ millions real	154	25	98	6	6	6	6	6	0	0	0	
Tax deductions for Capital Expenditure													
This assessment: - 15Nov 2020 G Rose: For this business, tax legislation reads that the bul	k of the capex is deducte	d over 5 years	straight line.	So in the cal	culations bel	ow the dimin	shing value	rate is 100%/	(5 years *150	06 = 30% .			
23Nov 2020 G Rose: And the tax legislation is that deductions for new e Look inside this cell to see the logic	quipment start with com	mercial product	tion, with cape	x being ded	acted fully in	the year in v	which it is spe	nt.					
Tax Deduction for Capital Expenditure 23Nov20 G Rose, Accountant emailed that \$7M has been spent on the p	% diminishing value roject (and is capitalise	d in the account	30% s) but only \$2	30% Miremains u	30% sclaimed dec	30% fuctions in th	30% le tax returns	30%	30%	30%	30%	30%	
Undeducted capex - opening balance Undeducted capex - added to pool	A\$ millions real A\$ millions real	154	2	27 98	125	92 6	69	52 6	41	0	0	0	
Undeducted capex - in pool Undeducted capex - available for deduction	A\$ millions real A\$ millions real	409	27	125	131	95 95	75	58 58	47 47	0	0	0	
23Nov20 G Rose: Unclaimed tax deductions can be claimed in the final tax deduction for capital expenditure	ear of use.	156	0	0	39	29	22	10	47	0		0	
Undeducted capex - closing balance	A\$ millions real	01	27	125	92	69	52	41	0	ō	0	0	
Chiece in deductions in Capito		UK.											
Years ->	units	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Cashstream 3: Operating Costs													
3 Mar 2020 Carlos Res. and sufficient acception and													
variable opex													
waste cost	A\$ millions real	28	0.0	7.5	7.5	6.3	3.8	2.5	0.0	0.0	0.0	0.0	
ore cost - variable	A\$ Real/ tonne ore		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
ore cost	A\$ millions real	13	0.0	0.0	2.4	3.0	3.0	3.0	1.5	0.0	0.0	0.0	
processing cost - variable processing cost	A\$ Real/ tonne ore A\$ millions real	151	35 0.0	35	28.0	35	35	35	35 17.5	35 0.0	35	35 0.0	
SX-EW cost - variable	A\$ Real/ tonne cathode		950	950	950	950	950	950	950	950	950	950	
SX-EW cost	A\$ millions real	77	0.0	0.0	14.4	18.0	18.0	18.0	9.0	0.0	0.0	0.0	
fixed opex supervision and technical	A\$ M/annum Real		2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	
General & Admin	A\$ M/annum Real	41	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0	6.0	
nivate multi													
private royalty rate	% of sales revenue		2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%	
private royarty	AS MILLIONS NEAL	1/	0	0	-		4	-	1	0	0	0	
rehab rehabilitation	A\$ Real/ tonne waste a	L one	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
rehabilitation	A\$ millions real	15	0	- 1	4	4	3	2	1	0	0	0	
closure closure	A\$ millions real				45	45	45	45	45	45	45	45	
closure	A\$ millions real	45			0	0	0	0	0	45	0	0	
Cashstream 3: Operating Costs opex per ore (incl closure)	A\$ millions real A\$/tonne ore	386	0	11 0	67 84	78	74	73	39 77	45	0	0	
opex per tonne final product (incl closure)	A\$/tonne cathode	4,752	0	0	4,457	4,117	3,932	3,839	4,088	0	0	0	
		Tatal	2016	1017	2018	1010	1030	1011	2022	2022	2024	2025	
Tears ->	units	1 OEAL	2016	2017	2018	2019	1020	2021	2022	2023	2024	2025	
Cashstream 4: Taxes													
Government Royalties												_	
21Dec20 G Rose: The government royalty rate is 6% of gross revenue	% of sales months		6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	
government royalty	A\$ millions real	40	0	0	8	9	9	9	5	0	0	0	
Income tax					be used by	and to be by							
Cashstream 1: Revenue	A\$ millions real	672	0	0	125	156	156	155	78	0	0	0	
Cashstream 3: Operating Costs	A\$ millions real	386	0	11	67	78	74	73	39	45	0	0	
government royalty tax deduction for capital expenditure	A\$ millions real A\$ millions real	40	0	0	39	9	9 22	9	5 47	0	0	0	
Assessable Income	A\$ millions real	90	0	-11	- 11	40	50	57	-12	-45	0	0	
Company Income Tax. Rate Income Tax	% of assessable incom A\$ millions real	27	30%	-3	30%	12	30%	30%	30%	30%	30%	30%	
Cashstream 4: Taxes	A\$ millions real	67	0	-4	11	21	24	26	1	-14	0	0	
Years ->	units	Total	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Cashflow and NPV													
Cashiows Cashstream 1: Revenue	A\$ millions real	672	0	0	125	156	156	155	78	0	0	0	
Cashstream 2: Capital Costs Cashstream 3: Operating Costs	A\$ millions real A\$ millions real	154 386	25	98 11	6 67	6 78	6 74	6 73	6 39	0 45	0	0	
Cashstream 4: Taxes Net Cashflow	AS millions real AS millions real	67 g.s	0	-1	11	21	24	26	1 22	-14	0	0	
100	Peal	16.8%										-	
Discustor													K
7Jul20 F Green email: discount rate for investment in gold industry is 85	Real.												
Discount Factor	a selli		36.0	0.89	0.82	0.76	0.71	0.65	0.61	0.56	0.52	0.48	
Discounted Cashflow	A\$ millions real	26	-24	-94	34	39	36	33	20	-18	0	0	
Cumulative NPV	A\$ millions real	76	-24	-118	-84	-45	-9	24	44	26	26	26	
	PAR INTEREST NEWS	20											

These best estimates are entered into an evaluation model in Excel.

This model is adapted from the worked examples available on this website: - <u>www.economicevaluation.com.au</u>

It is just one worksheet

with years across the top

and the four 'cash streams' set out in distinct blocks down the worksheet:

- 1. Production and Revenue
- 2. Capital costs
- 3. Operating costs

4. Tax

Each 'cash stream' is developed from first principles using the best estimates of the work team.

• The sub-totals of these four cash streams are aggregated into a row of overall 'net cashflow'.

From that net cashflow it is easy to see the 'health' of the project in each year. It is easy to compute the 'payback', the 'IRR' (Internal Rate of Return) and the 'NPV' (Net Present Value). These are common economic evaluation metrics that are explained later.

All team members feel confident they understand the evaluation model in Excel and hence the business that would underly the project!







Should the project be abandoned or promoted to a deeper study?

• If the economic model shows that the project never repays the cash invested or generates only a small surplus, then the work team probably should abandon the idea or put it aside. If later, a breakthrough is devised in one major aspect then the project and its economics can be revisited.

• If the project can repay the investment in a few years then it probably should be advanced to the next stage of 'pre-feasibility study'. There, all the marketing, production, capital costs and operating costs can be re-estimated with higher levels of accuracy. Different concepts and flowsheets can be compared. The evaluation model in Excel will need to be increased in complexity - but must be done as small easy-to-follow steps so everyone can easily follow the assessment.

• Where an **existing business** is being assessed and valued, the preliminary evaluation should be instrumental in deciding whether to proceed into a full study or put the idea aside.

Glossary

Business Case or 'Economic Evaluation'	A forecast of the 'economic health' of a business or project based on it's sales, operations, costs, taxes and net cashflow. It usually is over several years and computed in monthly intervals or in years. It gives a 'helicopter view' of the underlying economic strength of the business/project showing how much cash it will require to establish and whether it is likely to generate enough cash to 'stand on its own legs': to be self-supporting. Fundraising and ownership usually needs to be added when the business/project looks promising.
"financial modelling"	A misnomer for this activity, that is widely used, but can be accepted when used by others. Financial modelling is the subsequent activity of assessing various methods of funding and owning the project/business.
Four Cashstreams	Any business or project can be modelled in just four <u>cash</u> streams
Cashstream1: Revenue	The cash that will be received from sales of products and/or the delivery of services/benefits. This will require a forecast of prices, exchange rates, production/services/benefits, operations, logistics, etc
Cashstream 2: Capital Costs 'capex'	The cash that will be paid out to establish the project and the ongoing cash to be spent on purchases of things that will last more than one year - 'sustaining capital' - to keep it going.
Cashstream 3: Operating Costs 'opex' or 'expenses'	The cash that will be paid out to run the project and make the sales. Typically some will be 'fixed' or 'overheads' that are fairly constant over the months and others will be 'variable costs' that vary directly with the number of units made/sold.
Cashstream 4: Taxes	The cash that is paid out to meet the legislation of the various governments - incl income tax, value added tax and Government Royalties
Net Cashflow	Cash from revenue minus cash paid out as capital costs, operating costs and taxes.
Cumulative cashflow & payback	The running total of cash paid out/received from the beginning. Usually this becomes increasingly negative during construction and 'ramp up'. It improves when sales revenue exceeds all costs. When it improves back up to zero this is called "Payback". Then hopefully becomes strongly positive.

End of Module 1a