An Australian Government Initiative

Regional Development Australia

Please note this session is being recorded

Economic fundamentals

Presented by Regional Development Australia Yorke and Mid North

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Why does economics matter?

Utility

- Measure of overall wellbeing (of the individual, or society)
- Generally construed as a function of **consumption** and **choice**

Why does economics matter?

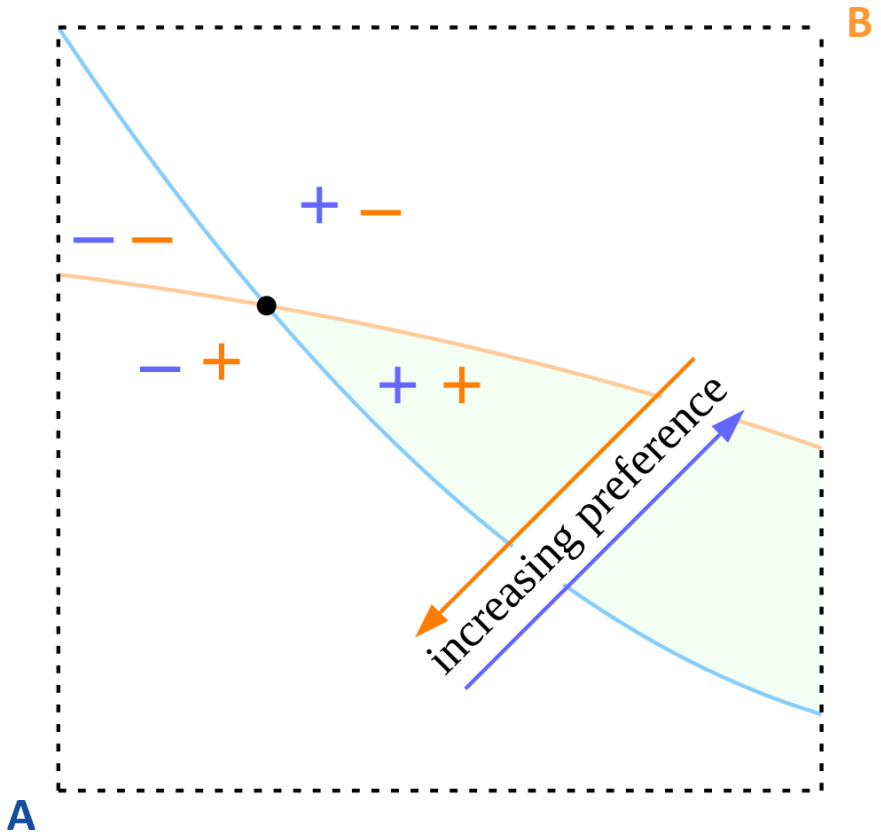
Constraints

- Limitations to the extent of consumption and choice
- Types of constraints:
  - Resources (i.e. budget, capital, labour)
  - Legalistic (i.e. statutes, contracts)
  - Social (i.e. norms, morals and values)

Tradeoffs

- Opportunity cost
  - The next highest-valued alternative forgone
- Marginal benefits, costs and propensities
  - How value and costs change with each extra unit
  - Changes to decision making

Why does economics matter?



Why does economics matter?

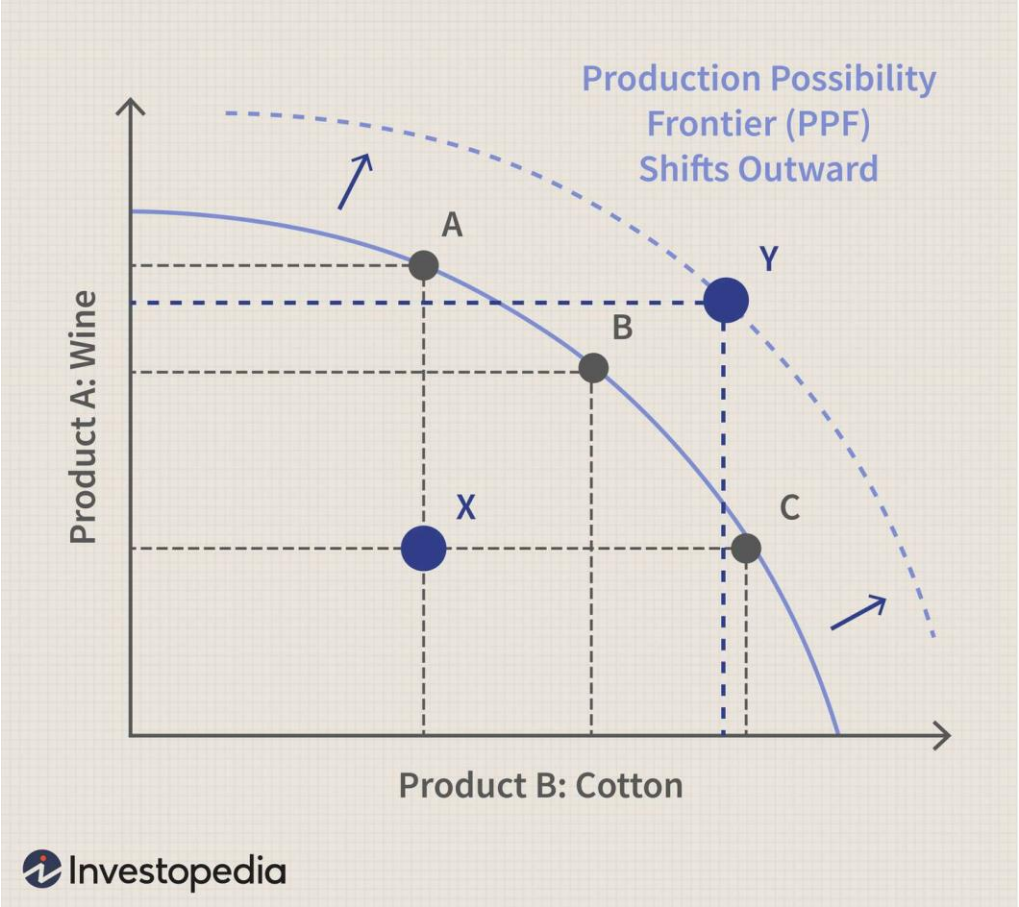
Efficiency

- Ratio of output to input
- High opportunity cost equals:
  - Low efficiency
  - Sub-optimal resource allocation
  - Reduced consumption and utility

Equity

- Who gets what is allocation
  - Who gets what they need is equity

Why does economics matter?



Frameworks for economic analysis

Feasibility study

- Used to understand whether a project can generate sufficient cash flows to secure required investment
- Examines cost structures, volume drivers and pricing
  - Should also cover market structure, competition, regulatory settings, funding and financing dynamics
- Compares likely cash flows against required rates of return
  - Project returns compared against Return on Equity (RoE) and Internal Rate of Return (IRR)

Pre-feasibility

- Based on desktop research
- Orders of magnitude basis
- Whether to commit the resources required for detailed analysis

Feasibility

- Undertake project-specific investigations
- Underpins project progression decision

Bankable (or detailed) feasibility

- Commission third-party investigations and studies
- Positive assurance on assumptions and analysis
- Underpins investment decision

Frameworks for economic analysis

Example feasibility study

1. **Reference concept and option definition**
   - Defining the concept and parameters for study
     i. Service
     ii. Assets
     iii. Routes
   - Regulatory approvals process(es)
   - Developing project option(s) for comparing approaches
2. **Market sizing**
   - Tourism and transport sectors in aggregate locally (volume and value)
   - Segment analysis (volume, value, demographics, characteristics and trends)
     i. Resident population
     ii. Freight task/vehicle movements for local road freight
     iii. Visitor economy
       - Overnight visitors in drive tourism market
       - Daytrip visitor market
3. **Competitor analysis**
   - Mode competition (i.e. road transport; private water transport)
     i. Market composition
     ii. Pricing
   - Destination competition in visitor economy (i.e. destinations)
4. **Potential revenues**
   - Volume drivers (i.e. market size, growth forecasts and forecast market share achievable)
   - Pricing options (i.e. willingness to pay, price points by competitors and value proposition)
5. **Potential cost structures**
   - Project costs
     i. Construction costs
     ii. Establishment costs
     iii. Other preliminaries
   - Financing costs
   - Operating costs
   - Cyclical and routine capital costs
6. **Financial assessment**
   - Cash flow analysis
   - Financial assessment
     i. Measures of performance
   - Break even analysis
7. **Economic assessment**
   - Potential economic benefits
8. **Risk management**
   - Risk identification and general management approaches
9. **Next steps**
   - Key conclusions
   - Stakeholder appetite(s)
   - Information gaps to be addressed
   - Go/no go decision to proceed with detailed feasibility study
     i. How to proceed

Frameworks for economic analysis

Economic modelling

- Used to measure changes in the economy as a result of activity
- Analyses the change in economic variables against a base case in an absolute sense
- Market activities only
- Model types:
  - Static (without price or quantity changes)
  - Dynamic (adjusting for price and/or quantity changes)

Cost benefit analysis

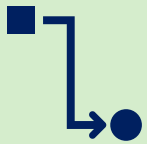
- Used to analyse the relative changes between options
- Analyses the costs and benefits of a given set of actions relative to a base case to compare relative merits
- Can capture non-market activities as well as market activities

Use cost benefit analysis to choose **between options**

Use economic modelling to show absolute merits of a **preferred option**

Frameworks for economic analysis

Types of economic models



Input-output

Allocates economic activity based on observed relationships ('flows') between industry divisions

Pros:
- Simple, accessible modelling tool
- Cost-effective
- Generally representative of first-order effects

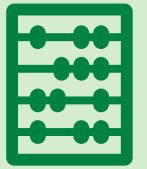
Cons:
- Does not capture change in economy
- Poor at capturing net effects

Partial equilibrium

Reallocates economic activity across the economy to account for changes in **either** price or quantities as a result of the initial change in the economy

Pros:
- Captures some change in the economy (prices or quantities)

Cons:
- Poor value compared with IO and GE models



General equilibrium

Reallocates economic activity across the economy after accounting for **both** price and quantity changes that result from the initial change in the economy

Pros:
- Fully captures changes in economy from changes in economic activity
- More robust – viewed favourably by Treasury

Cons:
- Relatively expensive
- Higher complexity

Measuring outputs (and inputs)

Type I (Direct)

- Effects resulting from the transaction of finished products (goods and services)
- Incurred by the parties engaged in the activity of interest

Treasury are normally interested in direct effects; other agencies are more variable.

Induced effects effectively double count income effects and should be set aside.

Type II (Indirect)

- Effects result from the consumptions of inputs to the production of finished products
- Incurred by third parties impacted (but not necessarily engaged) by the activity of interest
- Generally represented as
  - **Indirect** – activity stemming from the supply into final production
  - **Induced or consumption effects** – activity stemming from the incomes generated via direct and indirect activities

Measuring outputs (and inputs)

Output

- Value of goods and services produced in the reference period
- Can be direct (pertaining to the activity of interest) or indirect (enabled by the activity of interest)

Value added

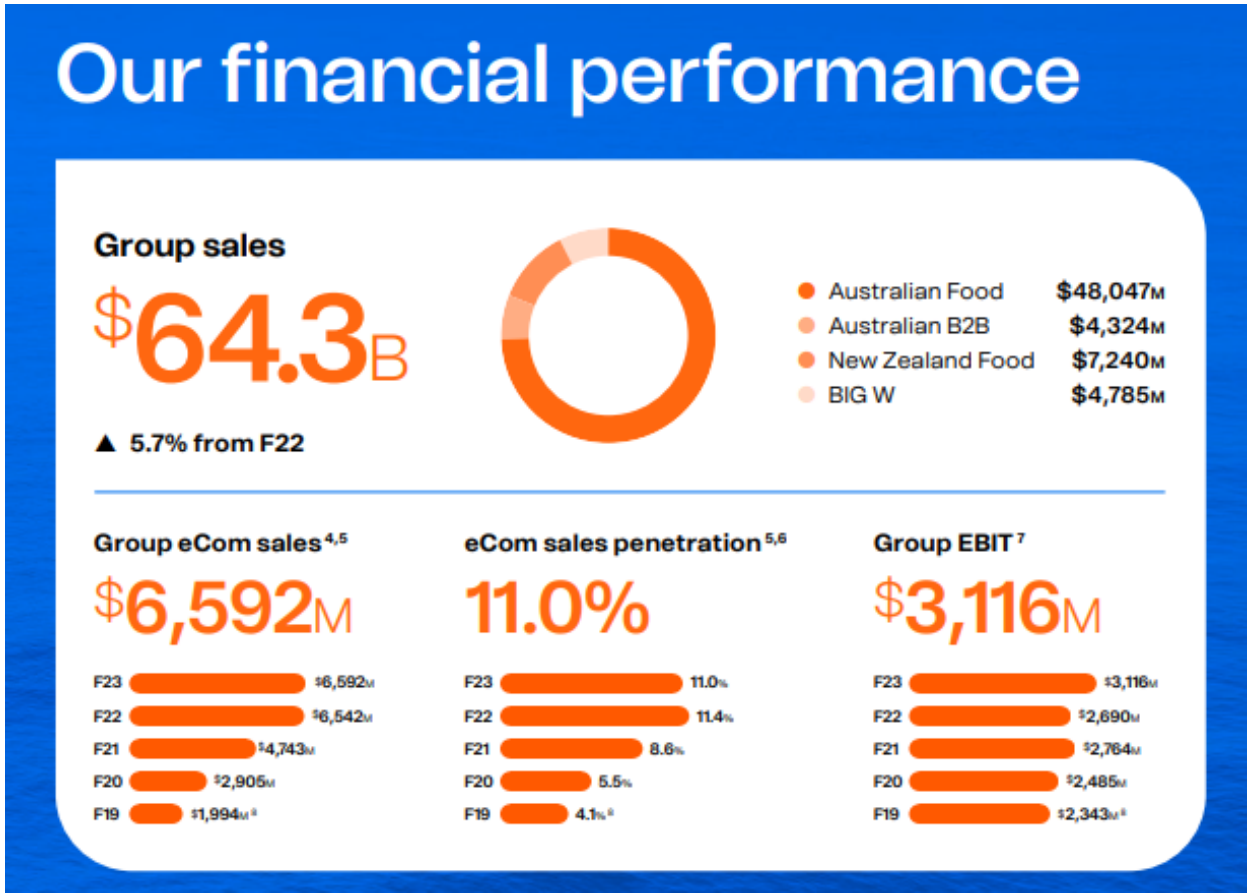
- Value added to an economy, most often calculated as the returns to labour (wages) and capital (profit)
- Estimated by total value of goods and services minus the cost of those goods and services used during production

Gross (R, S, D) product

- Sum of value added across an economy, inclusive of taxes on production
- Measured at the regional, state or domestic level

Measuring outputs (and inputs)

Output



Measuring outputs (and inputs)

Employment

- Labour employed in the production of goods and service
- Expressed in full-time equivalent (FTE) jobs

Wages

- Total returns to labour, inclusive of loadings, penalties and superannuation

Taxes

- Returns to government
- Taxes on production (independent of volume) and product (dependent on volume)

Labour is measured on the basis of hours to produce a given level of output.

The ABS' standard definition of a full-time equivalent job is **35 hours per week**.

Measuring outputs (and inputs)

Productivity

- Uplift in the ratio of output to input
- Generally enabled by greater physical or human capital (sometimes management)
- Ensure to avoid double counting when attributing productivity and output gains

Avoided costs

- Costs incurred under the base case that are avoided because of activity of interest
- Prominent examples include:
  - Operating costs
  - Transport (vehicle operating costs, travel time)
  - Health (healthcare costs, burden of disease)

Outcomes

- Better, greater outcomes which matter, but cannot be monetized (or attributed)
- Amenity values, generalised health improvements
- Relativities (compared with base case, and between options) are critical here

Measuring outputs (and inputs)

Benefits of health improvements

Activity

Greater (more intensive) participation in physical activity

Risk factor

Correlation between level of physical activity and risk factors observed for different health conditions

Co-morbidities

Rates of serious disease with different health conditions linked via risk factors

Health outcomes

Incidence of disease and costs associated with diseases

Productivity effects

Productivity changes from better participation and functioning

Reference

AIHW Burden of disease

Measuring outputs (and inputs)

Capital costs

- Construction costs
- Establishment costs (preliminaries, design)
- Cyclical maintenance
- Sustainment, decommissioning costs

Operating costs

- Operating costs are likely to vary between base case and options

Financing costs

- Servicing costs (interest payments)
- Distributions on equity

Be mindful how costs are captured and allocated over time; generally, cash flow is relied upon over accrual accounting

Qualifying benefits and costs

Identify activities impacted

- How does the activity of interest affect the region of interest
  - What outcomes differ in the presence, or following, the activity
  - What impacts result from the activity

Consider attribution and net additionality

- Which impacts would not result in the absence of the activity of interest
  - Which impacts would unfold in different timing in the absence of the activity

Source assumptions on price and volume drivers

- Do we understand how the activity affects the amount, timing and/or value of impact
- Is there evidence to inform a monetary or quantitative estimate of the extent of this change

Valuation and assessment methods

Benchmarking

- Used to estimate the value of a given parameter using a comparable proxy
- Suitable where the nature of the activity of interest is known and suitable proxies exist and appropriate data available
- Useful, cost-effective approach for early-stage investigations (i.e. pre-feasibility studies)

References

Visitor spending - SATC Regional Profiles

Government service delivery and costs – Report on Government Services

Active transport – ATAP active travel mode specific guidance

Vehicle Travel Time (VTT) and Operating Costs (VOC) for transport – Australian Transport Assessment and Planning Guidelines

Valuation and assessment methods

Benchmarking example – Robert Street, Maitland

Visitor expenditure					
Visitor expenditure, Dec 2023	**Visits**	**Nights**	**Spend**	**ALOS**	**Ave. spend p/n**
Overnight	523,000	1,525,000	$ 248,000,000	2.9	$ 162.62
International	8,000	95,000	$ 7,000,000	11.9	$ 73.68
Daytrip	664,000		$ 129,000,000		$ 194.28
Tourism consumption	**Dir. consumption**	**In-scope**			
Takeaway and restaurant meals	19%	1			
Shopping (incl/ gifts and souvenirs)	14%	1			
Fuel	12%				
Long distance passenger transportation	11%				
Accommodation services	10%				
Food products	7%	1			
Alcoholic beverages and other beverages	7%	1			
Travel agency and tour operator services	6%				
Est. in-scope spend per (O/N) trip	$ 38.22				
Traffic volume estimates (2019)	**AADT**	**Visitation rate**	**Base case (Visitors)**	**Project case (Visitors)**	
Roger Terrace - Elizabeth Street	2,700				
Non commercial vehicle share	89.5%	5.0%	121	155.86	
Elizabeth Street - Gardiner Terrace	2,400				
Non commercial vehicle share	89.5%	5.0%	107	138.55	
WTP - Footpath amenities	**Uplift in walking time**				
Lighting and/or CCTV	6.0%	https://www.nzta.govt.nz/assets/resources/Monetised-benefits-and-costs-mar			
Street trees or plantings	20.0%	https://www.nzta.govt.nz/assets/resources/Monetised-benefits-and-costs-mar			
Seating	1.0%	https://www.nzta.govt.nz/assets/resources/Monetised-benefits-and-costs-mar			
Signage and wayfinding	2.0%	https://www.nzta.govt.nz/assets/resources/Monetised-benefits-and-costs-mar			
Estimated visitor expenditure per annum					
Base case	$ 3,183,506.78				
Project case	$ 4,106,723.75				

Valuation and assessment methods

Benchmarking example – Robert Street, Maitland

Value of volunteering			
Median total hourly earnings (SA), Aug 2023	$	37.50	https://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/em
Participation rate, April 2021		40.4%	https://www.abs.gov.au/census/find-census-data/quickstats/2021/UCL41502
Value of leisure time		40.0%	Equated to value of private travel time per TfNSW advice - https://www.transport
Weighted average value of volunteering hour	*$*	*24.09*	Gross opportunity cost of wage rates methodology used by Department of Huma
Volunteering hours p.a.		832	YPC estimate, based on 8 volunteers providing 2 hours per week on community g
Estimated value of leveraged volunteering p.a.	**$**	**20,042.88**	
Shop activations			
Fitout cost ($ sqm)		1150	https://www.totalfitouts.com.au/blog/demystifying-commercial-fit-out-costs-in
Average shop size (sqm)		273.2	https://www.realcommercial.com.au/for-sale/maitland-sa-5573/
Estimated no. activations		4	1 Oct count had 25 retail shops, 11 vacancies - YPC 4 assumes 4 activations reas
Estimated average shop activation investment	**$**	**1,256,720.00**	

Valuation and assessment methods

Contingent valuation

- Used to measure non-market resources (those not bought and sold), or where prices do not capture full value
- Survey or stated preference approach to establishing what consumers/beneficiaries would be willing to pay as a proxy for level of utility
- Measured using
  - Opportunity cost
  - Discrete choice modelling
  - Stated preference surveys

References

Value of travel time - Transport for NSW (2015)

Value of volunteering - Volunteering SA&NT (2024)

Discount rates and valuing future benefits

Nominal v real

- Nominal or current prices refer to prices observed at a point in time
- Real or constant prices refer to a price relative to a point in time
- Real prices are typically relied upon in preparing and presenting economic analysis
- Historic values can still be relied upon (if representative) once adjusted for inflation

Discount rates

- Discount rates reflect inherent uncertainty in prices and value over time by adjusting future (or past) values to the present value
- Discount rates are typically drawn from the opportunity cost of capital (for private investment) or time preference discount rates

Office of Impact Analysis and most assessment authorities advise proponents to adopt a **7% discount rate** and sensitivities at 4% and 10%

Cost benefit analysis

Key steps

1. Define objectives
2. Set assessment criterion
3. Define base case and option(s)
4. Set model parameters
5. Map potential benefits and costs

Remember

- Criterion should reflect the objectives sought (assessment of options' relative performance across a range of factors)
- Base case is the most likely scenario in the absence of intervention – it is almost never 'do nothing'
- Options should be brought down from a long list to a short list to focus on those which are 1) feasible, and 2) realistic
- Model period should reflect the useful life of the asset or program

Cost benefit analysis

Key steps

5. Monetise, quantify or otherwise assess benefits and costs
6. Calculate cash flows
7. Run scenario analysis
8. Complete multi-criteria analysis
9. Finalise assessment

-> Kadina Childcare Centre example

Remember

- Take a whole-of-life approach to measuring costs and benefits
- Calculate nominal and discounted cash flows to compare for time sensitivity
- Use scenarios to test/show the impact of low certainty/high impact assumptions or factors
- Multi-criteria analysis is crucial to incorporate non-monetary factors into decision making

Multi-criteria analysis

Key steps

1. Set assessment criterion to reflect study objectives
2. Set out scoring matrix
3. Run scoring process
4. Validate scoring for directional fit
5. Perform any sensitivity analysis
6. Finalise assessment

Remember

- Decide how to deal with differences in certainty and information before starting
- For complex assessments, consider using pairwise scoring
- Use forced ranking when validating for directional fit
- Record rationale for assessments and any assumptions made

Multi-criteria analysis

Port Broughton childcare example

	1st	2nd	3rd	4th	5th	6th	7th	Score	Ave. score
Address service need									
Ability of the service model to meet the service requirement									
Child care + OSHC	5	0	0	0	0	0	0	35	5.0
Preschool + child care	0	3	1	0	0	1	0	25	3.6
Child care	0	2	1	0	0	0	0	17	2.4
Family care	0	0	1	0	3	0	0	14	2.0
Rural care	0	0	1	2	0	0	0	13	1.9
Occasional care	0	0	0	1	0	2	0	8	1.1
Do nothing	0	0	0	0	0	0	3	3	0.4
Complexity of facility requirements									
Expected cost, scale and complexity of facility required									
Occasional care	0	1	2	0	1	0	0	19	2.7
Child care	0	1	1	1	0	1	0	17	2.4
Rural care	0	0	1	2	1	0	0	16	2.3
Do nothing	2	0	0	0	0	0	1	15	2.1
Preschool + child care	0	1	0	0	1	2	0	13	1.9
Family care	0	0	0	1	1	2	0	11	1.6
Child care + OSHC	1	0	0	0	0	0	4	11	1.6
Complexity of staffing requirements									
Expected cost, size and complexity of staffing required									
Do nothing	5	0	0	0	0	0	0	35	5.0
Occasional care	0	3	2	0	0	0	0	28	4.0
Rural care	0	1	2	2	0	0	0	24	3.4
Family care	0	1	1	2	0	0	0	19	2.7
Child care	0	0	0	0	4	0	0	12	1.7
Child care + OSHC	0	0	0	0	0	3	1	7	1.0
Preschool + child care	0	0	0	0	0	1	3	5	0.7

Multi-criteria analysis

Port Broughton childcare example

Minimum feasible size									
How easy it would be to 'right size' service - i.e. very large or inflexible sizes expected to be less favourable									
Do nothing	5	0	0	0	0	0	0	35	5.0
Family care	0	3	2	0	0	0	0	28	4.0
Rural care	0	0	3	2	0	0	0	23	3.3
Occasional care	0	2	0	2	0	0	1	21	3.0
Child care	0	0	0	0	3	1	1	12	1.7
Child care + OSHC	0	0	0	1	0	3	1	11	1.6
Preschool + child care	0	0	0	0	2	1	2	10	1.4
Integration and inter-operability									
How well or easily the service can be implemented alongside/with other services									
Rural care	0	0	4	1	0	0	0	24	3.4
Occasional care	0	2	1	0	2	0	0	23	3.3
Do nothing	3	0	0	0	0	0	0	21	3.0
Child care	0	1	0	2	2	0	0	20	2.9
Child care + OSHC	2	0	0	0	0	3	0	20	2.9
Family care	0	1	0	2	1	1	0	19	2.7
Preschool + child care	0	1	0	0	0	1	3	11	1.6
	Deliverability	**Sustainability**	**Service need**	**Facility**	**Staffing**	**Size**	**Integration**	**Aggregate**	
Weighting	*0.083333333*	*0.083333333*	*0.5*	*0.083333333*	*0.083333333*	*0.083333333*	*0.083333333*		
Option									
Child care + OSHC	2	2	7	1	2	2	3	4.5	
Child care	3	3	5	6	3	3	3	4.25	
Rural care	4	5	3	5	5	5	7	4.083333333	
Occasional care	6	6	2	7	6	4	6	3.916666667	
Family care	5	4	4	1	4	6	2	3.833333333	
Preschool + child care	1	1	6	3	1	1	1	3.666666667	
Do nothing	7	7	1	4	7	7	5	3.583333333	

Economic modelling

Key steps

1. Define objectives
2. Define base case and option(s)
3. Set model and model parameters
4. Map potential benefits and costs
5. Monetise, quantify or otherwise assess benefits and costs
6. Run the economic model(s)
7. Run scenario analysis
8. Finalise assessment

Remember

- Choose the right modelling framework for the purpose and audience
- Focus on capturing net effects, not aggregate effects
- Use scenarios to test/show the impact of low certainty/high impact assumptions or factors

Tips for performing economic analysis

Define the base case carefully

- Be mindful that existing activities cannot be sustained in perpetuity if the asset can't be used reliably
- In the event the base case involves discontinuing the asset, incorporate decommissioning costs

Frame all potential benefits and costs

- Benefits and costs which can't be monetised can still be incorporated into multi-criteria analysis
- Include sustainment and lifecycle costs

Match effort with importance

- Consider who the audience(s) is/are for the modelling and their expectations
- Calibrate effort in sourcing information to inform assumptions
- Use sensitivities and ranges to moderate assumptions

Tips for performing economic analysis

Record all sources and assumptions

- Can’t assume readers of the analysis will follow the logic unless it is spelt out
- Recording assumptions and sources will allow you to explain and update as needed

Lies, damned lies and statistics

- Referencing evidence to support assumptions is necessary, but not necessarily sufficient
- Use evidence to inform assumptions as proxies, but don’t overstate reliance

Excel tips for economic analysis

Calculate values separately from cash flows

- Set your assumptions in one sheet and calculations in another
  - Set price and volume drivers separately
  - Calculate cash flows in a separate sheet to allow changes to flow though workbooks

Avoid hardcodes

- Hard codes are typed (rather than calculated) values
- Hardcoded values should be grouped together under assumptions to:
  - Minimise duplication of changes
  - Avoid missing values when updating assumptions

MS Excel's NPV function discounts from year 1

- NPV function applies to all years included in the range; if the base year is Year 1 in the model apply the NPV calculation from Year 2 onwards