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User guide: Nelson Regional Development Agency economic impact assessment tool

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Introduction

Nelson Regional Development Agency (NRDA) commissioned an excel-based economic impact assessment tool from Benje Patterson | People & Places. The tool can be downloaded here (https://www.benjepatterson.co.nz/wp-content/uploads/2021/12/NRDA-Economic-Impact-Tool.xlsx, the tool is password protected using the password provided to NRDA staff by Benje Patterson).

The aim of the tool is to provide a consistent framework for performing in-house economic impact assessments of projects and initiatives within Nelson-Tasman.

The tool is a guided interface within excel where users input certain assumptions and characteristics of the project, which are then automatically run through an economic multiplier model. The results are then presented back to the user so that they can quickly ascertain the likely economic impacts of their project.

This document is a technical guide for NRDA staff who intend to use the tool. It outlines how staff should input information into the tool, which background calculations occur, and how results can be interpreted.

Structure and use of the tool

The excel-based tool contains 3 sheets. These sheets are:

1. Input – general assumptions
2. Input – project operations
3. Results – economic impacts.

The remainder of this document provides guidance for:

- How NRDA staff should input information into the first two sheets;
- An overview of how background economic impact calculations are performed using the assumptions from NRDA staff, and;
- How results can be interpreted.

'1. Input – general assumptions'

When users open the tool, the first sheet that they need to put information into is called '**1. Input – general assumptions**'.

Before beginning to input in any assumptions, it is generally advised that you open a master version of the tool on your system that is free of project specific details and then click 'save as' and create a copy of the tool. Using a copy of the tool each time you run through a round of valuing economic impacts avoids the risk of leaving details from previous projects in the tool each time you run it.

Within the '**1. Input – general assumptions**' sheet the user must begin by identifying some high-level information about the project in the '**projects table**'. The steps within this process are:

1) **Project name and start year** - The first step is to enter the project name (column C) and the year in which the project will start (column D). If the project start year is unknown then simply set the start year as the present year – the start year does not affect the subsequent calculation methodology and is used to populate table headings in the results section.
2) **Going concern** - The next step is for the user to select in column E whether the project is a 'going concern'. If the project is a going concern then select 'TRUE' in the drop down box, while if it is only going to operate for a finite number of years then select 'FALSE'. Characterising the project as a going concern means that it is assumed the project has an indefinite lifespan and will continue to operate beyond the years in which operating assumptions are inputted in the second sheet of the tool. The lifespan of a project has implications for how the project is ultimately valued as if it is a going concern then the model will assign a valuation into perpetuity for future economic benefits beyond the years that have been explicitly assigned activity by the user.
3) **Public funds** – If public funds are being invested in the project then the user can input the dollar value of public funds anticipated to be invested at the establishment of the project and at various points thereafter. You do not need to enter any public funds assumptions here if you do not want to – doing so will not affect your ability to calculate the economic benefit of the project, but will prevent you from comparing the economic benefits against the cost of the public investment.
4) **Repeat for additional projects** – you can repeat steps 1 to 3 for up to five projects at a time.

After putting assumptions into the '**projects table**', the user must then put other high-level assumptions into the '**other inputs and assumptions**' table in the '**1. Input – general assumptions**' sheet. These are:

5) **Discount rate** – Input the relevant discount rate you wish to use in your valuations - it is generally advised that you use the standard 5.0% rate suggested by The Treasury. The discount rate is used in subsequent valuations calculations to work out the relative value of economic impacts that occur in the future compared to those impacts that occur when the project begins.
6) **Nelson-Tasman total GDP and filled jobs** - Check that the total GDP and jobs baseline estimate for Nelson-Tasman is still the most recent data - an initial baseline for 2020 has been entered from the Infometrics economic profile (2021 data will become available from Infometrics in January 2022). These baseline estimates of total GDP and filled jobs across Nelson-Tasman are used in the results section for putting the magnitude of the economic impacts of the project in perspective relative to the total size of the Nelson-Tasman economy and job market.

Once steps 1 to 6 have been completed in the '**1. Input – general assumptions**' sheet, then the user should move on to the next sheet in the tool ('**2. Input – project's operations**').

'2. Input – project's operations'

The '**2. Input – project's operations**' sheet is the next input step after filling in the '**1. Input – general assumptions**' sheet. In the '**2. Input – project's operations**' sheet, the user puts specific information about the operations of the business/project. The user can choose to either put in information about the revenue which the business/project is anticipated to generate or the number of people it will employ.

The flexibility to put in either revenue or jobs data has been integrated into the model to overcome information challenges when doing due diligence. At times, NRDA staff may have been able to ascertain the approximate staffing requirements of a new initiative, while at other times they may have been told (or able to easily estimate) an approximate level of revenue that the business will generate each year.

The base assumption regarding revenue or jobs should be entered into the appropriate industry in which the project activity is primarily located and the year in which it is occurring. There is flexibility to input data pertaining to a project's establishment phase and up to 10 years thereafter. If the project will operate in several sectors then you may split your input data into more than one industry.

Practically speaking, the way to use this sheet is to:

1) For each industry you are choosing to enter operational information into for your project you change the dropdown box in column E from 'FALSE' into 'TRUE' using the dropdown box.
2) Enter revenue or jobs data for your project for that industry in the relevant year.
3) Repeat steps 1 and 2 for each project you are performing analysis of.

The following are examples for illustrative purposes:

- A new cheese factory has been proposed that costs $5 million to build at the establishment and then once operational will employ 100 in year 1 to year 5 and then 120 people thereafter. You would input $5 million as revenue for building construction in establishment, and then then you would input 100 jobs within dairy product manufacturing in each of years 1 to 5 and 120 jobs in each of years 6 to 10.
- A professional service firm has announced that they will take over a vacant office and open up a satellite office in Nelson which they will initial start with 50 staff and then rise by 10 staff per year until it reaches 100 in year 6. You would enter these staffing number assumptions into professional, scientific, and technical services for the relevant year.
- A $50 million hotel will be constructed. The hotel will have 100 rooms. The developer has not told you their revenue estimate, but you know hotels in Nelson on average have 80% occupancy

and an average room rate of $100 so you estimate that it will generate approximately $2.92 million of revenue each year. You would input $50 million as revenue for building construction in establishment, and then you would put $2.92 million in years 1 to 10 as revenue for accommodation and food services.

Each example above is for projects that would be considered to be going concerns so you would have ensured that the project was captured as a going concern in the '1. Input – general assumptions' sheet.

At times there may be considerable uncertainty regarding how successful an initiative will be – in such situations you may wish to run several scenarios (eg. conservative, middle and high). To do this you could simply run the tool for your project three times, once for each scenario.

How economic impact calculations are performed

Background information about projects that has been inputted into the tool by NRDA staff is then run through an economic multiplier model.

The model contains industry-specific economic multipliers, which are factors that describe the relationships within Nelson-Tasman between revenue, employment, and economic value add (GDP). These multipliers are given for effects that directly accrue within economy from the business/project, and for indirect (downstream) effects that accrue within the economy from the effects of the business/project on other industries. These indirect effects occur because of:

a) Additional value added from the procurement of other goods and services as inputs into the new business/project. For example, accountancy and legal services, maintenance of machinery, paying for support services, buying provisions from wholesalers, etc.
b) The recirculation of wages earned by workers back into other industries. For example, a worker in the new businesses will spend some of their wages on retail or hospitality within Nelson-Tasman.

Indirect effects from multiplier analysis should be taken as a theoretical maximum of additional downstream economic activity supported by the new business/project, because in the absence of the new business/project, some of the downstream resources wouldn't be sitting idle and may be applied to other uses.

Economic multipliers used in the model have been sourced from Infometrics, who are an economic consultancy which specialises in regional economic data. These economic multipliers are consistent with other Infometrics datasets already used widely in Nelson-Tasman.

Multiplier analysis is a form of partial equilibrium analysis that assumes relationships between industries in the rest of the economy remains constant. This assumption means that care should be taken when interpreting the results of extremely large economic development projects which create more than a 0.5% change in total GDP across the region – projects of this size of larger can alter the underlying structure of the local economy in ways that may not be factored into existing multipliers.

Interpreting results in '3. Results – economic impact'

The results from the economic multiplier analysis are presented in the '3. Results – economic impact' sheet. Within this sheet, there are tables and autotext that are automatically populated with results for up to five different projects that NRDA staff have inputted assumptions for.

The following results are given in the first table:

- **GDP – direct effect:** The direct GDP effects from the initial establishment and each of the first ten years of the business/project are given. Direct GDP is the direct contribution of the business/projects to economic value add in Nelson-Tasman.
- **GDP – indirect effect:** The indirect GDP effects are the downstream effects of the new business/project on other parts of Nelson-Tasman's economy from the initial establishment and each of the first ten years of the business/project. These indirect GDP effects occur because of the procurement of other goods and services from other industries as inputs into the new business/project, as well as the recirculation of wages earned by workers back into other industries. Indirect effects from multiplier analysis should be taken as a theoretical maximum of additional downstream economic activity supported by the new business/project, because in the absence of the new business/project some of the downstream resources wouldn't be sitting idle and may be applied to other uses.
- **GDP – total effect**: The total GDP effect is the sum of the direct and indirect effects.
- **Jobs – direct effect:** The jobs that are likely to be directly supported by the business/project are given for the initial establishment and each of the first ten years. Direct jobs are an estimate of employment that could be generated, based on the level of direct GDP the project is expected to support in the Nelson-Tasman economy.
- **Jobs – indirect effect:** The indirect jobs effects are the downstream effects of the new business/project on employment in other parts of Nelson-Tasman's economy during the initial establishment and each of the first ten years of the business/project. These indirect jobs effects occur because additional employment is supported as a result of the new business/project procuring goods and services from other industries, as well as the recirculation of wages earned by workers back into other industries. Indirect effects from multiplier analysis should be taken as a theoretical maximum of additional downstream jobs that could be supported by the new business/project, because in the absence of the new business/project some of the downstream workers wouldn't be sitting idle and may be applied to other uses.
- **Jobs – total effect**: The total jobs effect is the sum of the direct and indirect effects.
- **Public funds invested**: These are the public funds that are expected to be invested in the project. These are based on the figures inputted by NRDA staff in the '**1. Input – general assumptions**' sheet. Public funds invested are given so that at a glance you can compare the public cost of supporting the new business/project each year.

The second table then expresses:

- **GDP (direct, indirect, total) as a percentage of Nelson-Tasman's total GDP**. This helps see how big the contribution of the new business/project is relative to the overall size of Nelson-Tasman's economy.
- **Jobs (direct, indirect, total) as a percentage of total employment across Nelson-Tasman**. This helps see how big the likely contribution of the new business/project to employment is relative to the overall number of jobs in Nelson-Tasman.

Below the table are several net present value (NPV) and cost (NPC) calculations, which all use the discount rate inputted into the '**1. Input – general assumptions**' sheet by NRDA staff . These NPV and NPC calculations include:

- **NPV of GDP**: This is the NPV of the direct and total GDP effects of the project. NPV of the GDP effects is the total value of the expected benefits of the project across its lifespan from a direct and total (direct and indirect) perspective. This figure incorporates both the first 10 years of GDP

effects and also assigns a valuation to years that occur thereafter if the project has been assumed to be a 'going concern'.

- **NPC of public funds invested:** This is the NPC of the public funds invested in the project. This is the total cost of all of the public funds invested in the project based on the public funds figures inputted by NRDA staff for the project establishment and its first 10 years. All public funds used in this calculation have been inflated by 20% to incorporate the 'deadweight loss' (DWL) of taxation. DWL captures the idea that taxation can cause inefficiencies in the economy by affecting incentives to do certain things that people would do in the absence of taxation. The DWL concept is a factor that captures these inefficiencies and is an additional cost of taxation above and beyond the dollar figure of what is actually taxed.
- **Ratio of the NPV of GDP to the NPC of public funds invested**: This ratio allows you at a glance to quickly ascertain the return on public funds invested. The ratio is given for the costs relative to both the direct and the total NPV of benefits. If the ratio is greater than one, then the project will return more benefits over its lifespan than what it requires in public funds to be invested. Theoretically, projects with a higher ratio are a better investment from a public funds perspective – that being said, projects with a higher ratio of benefits to cost may be more risky, or this high ratio might be contingent on benefits that occur a long time in the future.