TO: Dunedin City Council

RE: Impact on Dunedin economy of loss of Invermay job losses

August 2013

BERL was requested to provide a brief summary of the short-term effects on the Dunedin City economy of the loss of 85 jobs from the Invermay AgResearch campus.

The calculation of the standard multiplier effects are hindered as information on the composition of the proposed job losses is limited. We understand that the AgResearch proposal reduces the number of jobs by 85, with 30 roles remaining at the Invermay campus.

In the absence of further information, we assume that the 85 jobs are all full-time positions. Further, we use implied average wages for the "scientific research and computer services" industry from regional input-output tables for Dunedin City. Similarly, we use input-output ratios and multipliers from this source to calculate the impacts on GDP and gross output expenditure, as well as indirect and induced effects.

In summary

- the direct loss of 85 jobs from Invermay would result in a direct reduction in Dunedin GDP of $8.9m.
- the direct reduction in gross output expenditure would be the equivalent of $15.8m.
- incorporating indirect and induced effects
  - there would be a total reduction of 146 FTE positions across the City.
  - Dunedin City GDP would decline by $15.9m, with gross output expenditure down by $29.4m

Impact of loss of 85 jobs from Invermay on Dunedin City economy

	Direct effect	Indirect effect	Direct + indirect effect	Induced effect	Total effecct
Employment FTEs	85	30	115	31	146
GDP ($m)	8.9	3.1	12.0	3.9	15.9
Gross output expenditure ($m)	15.8	6.2	22.0	7.4	29.4

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Notes

The underlying logic of multiplier analysis is relatively straightforward. An initial impetus (direct effect) in an industry creates flows of expenditures that are magnified, or "multiplied", as they flow through to the wider economy. This occurs in two ways.

- The initial industry purchases materials and services from supplier firms, who in turn make further purchases from their suppliers. This generates an indirect effect.
- People employed directly in the industry and in firms supplying services earn income (mostly from wages and salaries, but also from profits) which, after tax is deducted, is spent on consumption. There is also an allowance for some savings. These are the induced effects.

Hence, for any amount spent in an area (direct effect), the actual output generated from that spend is greater once the flow on activity (indirect and induced effects) are taken into account.

This multiplier analysis uses multipliers derived from inter-industry input-output tables for the Dunedin City area. These tables have been derived from the national input-output tables and other data by Butcher Partners, Canterbury - a recognised source for regional input-output tables and multipliers.

Multipliers allow us to identify the direct, indirect and induced effects in terms of gross output, gross domestic product, (GDP), and full time equivalent (FTE) employment.

Definitions

(1) Gross output is the value of production, built up through the national accounts as a measure, in most industries, of gross sales or turnover. This is expressed in $ million at constant prices. Gross output is made up of the sum of

- compensation of employees (i.e. salaries and wages)
- income from self-employment
- depreciation
- profits
- indirect taxes less subsidies
- intermediate purchases of goods (other than stock in trade)
- intermediate purchases of services.

(2) GDP (or value added) multipliers measure the increase in output generated along the production chain; which, in aggregate, totals GDP. Value added is made up of the sum of

- compensation of employees (i.e. salaries and wages)
- income from self-employment
- depreciation
- profits
- indirect taxes, less subsidies.

(3) FTE is a measure of the full-time equivalent of a job. A full-time position is counted as 1 FTE, while a part-time position is counted as 0.5 of an FTE.

Provisos

Multiplier analysis is only a “partial equilibrium” analysis, assessing the direct, indirect and induced effects of a particular change. These effects are more appropriately interpreted as short-term effects.

To assess inter-industry impacts in full would require economic modelling within a “general equilibrium” framework. Applying such models becomes more relevant where the particular development is considered significant within the overall economy.

Generally the more developed, or self-sufficient, an industry is in a region, the higher the multiplier effects. Conversely, the more reliant an industry is on supply inputs from outside of the region, the lower the multipliers. These outside factors can be referred to as “leakages”.