



**Southern Institute of Technology**

**Economic Impact on Invercargill  
of SIT's Zero Fees Policy**

**Infometrics Consulting  
August 2002**

# 1. Summary

In August 2000 we estimated the economic effect on Invercargill of the zero fees scheme to be introduced in 2001 by the Southern Institute of Technology. The main findings were that in 2001 the Scheme would generate approximately:

- \$11.5m in additional business turnover
- \$6.7m increase in Invercargill's GDP
- a rise in employment of up to 113 full time equivalent positions
- a 2:1 ratio of the increment in GDP to the input of community funds.

With the Scheme now well into a second year it is timely to re-assess how it is contributing to the local economy. In the previous report the expenditure by new SIT students on local goods and services had to be projected from other estimates of student expenditure. For this updated study SIT undertook an expenditure survey of about 300 of their students. This provides us with much more reliable data than was previously available.

Total expenditure by students attracted to SIT by the zero fees policy is estimated at \$26.6m. Excluding expenditure of a capital nature and taxes such as GST and excise taxes, yields an estimated \$22.4m of net new consumption expenditure.

Government funding provided to SIT for the additional students is worth another \$6.4m, raising the total direct consumption expenditure to \$28.8m. Of this it is estimated that \$17.0m is spent on locally produced goods and services, with imports from elsewhere in New Zealand and overseas constituting the balance.

The economic flow-on effects associated with the spending on local goods and services are as follows:

- Total gross output (turnover) by Invercargill businesses will be \$25m higher in 2002 than it would have been without SIT's zero fees policy.
- This is associated with a rise in Invercargill's gross domestic product of \$13.9m, more than double the value previously estimated for 2001.
- Additional employment is estimated at 266 full time equivalent jobs.
- The ratio of the increment in GDP to the input of community funds is better than 5:1, considerably more than earlier estimate for 2001 of 2:1.

A brief summary of the results of the survey is presented in Section 2 and the revised economic impact estimates are presented in Section 3.

## 2. Summary of Student Survey

The objective of the survey is to ascertain the amount of expenditure by students who, were it not for the zero fees scheme, would not have attended SIT. There are thus two groups of students to be identified:

1. Students from outside Invercargill who would not otherwise have studied at SIT.
2. Students from Invercargill who would otherwise have left the city.

A survey of 298 students yielded the results shown in Table 2.1. The composition of expenditure is shown in Appendix A. Of the 298 students, 169 are from outside Invercargill and 129 are residents. The numbers who would not have studied at SIT in the absence of the zero fees scheme are 132 and 40 respectively.

**Table 2.1**  
**Summary of Expenditure**

	Students from outside Invercargill	Students normally resident in Invercargill	Total
Number in survey	132	40	172
Gross Expenditure			
Mean	\$10274	\$11940	\$10661
Standard deviation	\$5516	\$6533	
less Capital items*	\$556	\$1034	\$667
equals Consumption expenditure	\$9718	\$10906	\$9994
less GST	\$769	\$870	\$792
less Excise tax	\$162	\$215	\$174
equals Net consumption expenditure	\$8787	\$9821	\$9027

\* Mostly mortgage principal repayment and home renovation.

The survey pertained to students who undertake a full time course of study, although not all students study for a full year. To guard against over-estimation of expenditure by these students, reported weekly expenditure was multiplied by the number of weeks students intended to live in Invercargill.

The number of students in full time programmes at SIT for the full year 2002 is projected by SIT to be approximately 5000. Together with the survey proportions plus data for 2001, this allows us to estimate the net number of students who are attending SIT in 2002 because of the zero fees scheme.

**Table 2.2**  
**Projection of Net Additional SIT Students**

	Students from outside Invercargill	Students normally resident in Invercargill	Total
Full year 2001	1586	2649	4235
% net additional (from survey)	78.1%	31.0%	
Implied net additional no.	1239	821	2060
Scaled to 2002	1872	3128	5000
Implied net additional for 2002	1463	970	2433

An estimated 2433 students attend SIT because of the zero fees scheme. Note that the implicit assumption is that the growth in student numbers between 2001 and 2002 occurs *pro*

*rata* over students who have been specifically attracted by the zero fees scheme and students who would have studied at SIT regardless. It is likely, however, that most of the growth has been in the former group.

The above results lead to estimates of direct expenditure in Invercargill attributable to SIT's zero fees scheme. These are shown in Table 2.3.

**Table 2.3**  
**Net Additional Expenditure of SIT Students**

	Students from outside Invercargill	Students normally resident in Invercargill	Total
Gross expenditure	\$15.0m	\$11.6m	\$26.6m
Consumption expenditure	\$14.2m	\$10.6m	\$24.8m
Net consumption expenditure	\$12.9m	\$9.5m	\$22.4m

Gross expenditure by students who would not be studying at SIT were it not for the zero fees scheme is estimated at \$26.6m. Excluding expenditure on housing which is of a capital nature yields estimated total consumption expenditure of \$24.8m. Subtracting direct leakages to central government, notably GST and excise tax on alcohol (for home consumption), tobacco and petrol, leaves net consumption expenditure of \$22.4m.

## 3. Multiplier Effects

### 3.1 Multipliers for SIT Students in Invercargill

The reader is referred to the 2000 report for a full discussion on multipliers. A condensed discussion follows.

Each dollar spent on the output of one industry leads to output increases in other industries. For example for SIT to deliver education services to a student it requires inputs of books, energy, communication services and so on. Part of SIT's income is used to cover the cost of these items. Another part covers the cost of the buildings and equipment (spread over their useful lives) and there is a large portion for staff wages and salaries. The supplying industries such as energy require inputs themselves, pay wages and salaries and so on.

The effect on these supplying industries is known as the upstream or indirect production effect and is commonly measured by a 'Type I multiplier' which is defined as the ratio of the direct plus indirect effect, to the direct effect.

The effect brought about by the initial payment of wages and salaries is generally known as the downstream or induced consumption effect, as wages and salaries are used to purchase household consumption goods. Their production and sale requires inputs from other industries and so on as before. Again the effect may be measured by a multiplier. The total multiplier (Type II) is defined as the direct, plus indirect production, plus induced consumption effects, divided by the direct effect.

There are some limitations to multiplier analysis which should be noted:

- it assumes that all factors of production are in excess supply,
- it does not allow for price changes (such as if a factor is in limited supply) which may lead producers to change inputs thereby altering their production structure,
- it assumes that average relationships hold at the margin.

All of these effects have the potential to undermine the results of multiplier analysis.

A set of economic multipliers for SIT students has been derived from industry specific multipliers,<sup>1</sup> weighted by the composition of student expenditure. Three different measures of economic activity are used:

- gross output (usually the same as turnover)
- value added (gross output less expenditure on inputs from other industries)
- employment

Table 3.1 below compares the important Type II value-added multiplier for SIT students with that for some other industries in Invercargill.

The table shows that the multiplier for SIT students ranks around the middle of those listed. In general the value of the multiplier falls, the more removed the industry is from processing raw materials. Most of the value of output of processing industries is accounted for by the cost of the raw material input, which is also captured in the value of the output of the raw material supplier. In these industries there is a relatively low amount of value being added directly, which is reflected in the value-added to gross output ratio shown in the second data column of the table. It is low in industries such as Meat Processing and high in industries such as Communications.

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<sup>1</sup> The industry specific multiplier have been estimated for this exercise by Butcher Partners.

**Table 3.1**  
**Multipliers for Selected Industries**

	Type II VA multiplier	VA/GO ratio	Net Product
Student Services	1.61	0.53	0.86
Dairy Farming	1.48	0.54	0.80
Forestry (logging)	1.56	0.52	0.81
Meat Processing	2.13	0.26	0.55
Wood Processing	2.01	0.30	0.60
Machinery & Equipment	1.85	0.32	0.59
Communications	1.38	0.54	0.75
Health	1.49	0.67	1.00

The combined effect of these two factors is shown in the right hand column of the table. For SIT students the value of 0.86 means that for every dollar spent on locally produced goods and services by students from outside Invercargill (or retained in Invercargill), Invercargill's gross domestic product will rise by 86 cents. This may seem like a low rate of return, but it is not. It simply reflects the fact that a city the size of Invercargill is not totally self-sufficient. Some goods and services are imported. A net leakage of 14 cents per dollar is low. For the industries shown, only the Health industry has a proportionately larger effect on the city's GDP. In contrast the manufacture of machinery and equipment contributes only 59 cents to the city's GDP for every dollar of spending.

### 3.2 Economic Flow-on Effects

The estimated economic flow-on effects of spending by SIT students are shown in Table 3.2. More details of the calculations are given in Appendix B.

**Table 3.2**  
**Economic Flow-On Effects of Zero Fees Policy in 2002**

	Gross Output (\$m)	Employment (FTE)	Value-Added (\$m)
Direct	17.0	178.6	9.1
Net (excl trade diversion)	16.2	169.7	8.6
Net + Indirect	21.3	230.5	11.8
Net + Indirect + Induced	25.2	266.2	13.9

Before the estimated \$22.4 of net consumption (from the previous section) can be used in an economic impact analysis, three adjustments are required.

1. The \$22.4m only covers expenditure by the students on living costs. We need to add the government funding received by SIT for every additional student. This is worth about \$6.4m, net of GST.
2. We need to subtract goods and services which are not made locally, that is those which are imported from either elsewhere in New Zealand or from overseas.

These two adjustments bring about a net reduction of the \$22.4m to \$17.0m. In Table 3.2 this is labelled as the direct gross output effect.

3. As in the previous report there is also a small adjustment for 'trade diversion.' The issue is whether the funds distributed by the community trusts to SIT so that student fees could be abolished (thereby acting as an incentive to attract more students), provide more leverage in terms of on-going economic activity than the sorts of community projects usually funded by the trusts?

That is, part of the additional economic activity generated by the increase in students at SIT is not really additional. It would have occurred anyway because of the type of projects which would otherwise receive funding from the trusts. Previously we assumed that 5% of the trade creation is actually trade diversion. Community funding for 2002 is understood to be \$2.4m. Five percent of student expenditure is about \$1.1m or about 46% of the community funds. This implies that other uses of the trusts' funds would have an average leverage effect of nearly 50%. This is probably on the generous side.

As shown in Table 3.2, the 5% adjustment yields a net trade creation effect of \$16.2m. This constitutes the basis for the application of multipliers.

## **Output**

The \$16.2m of gross output generates \$5.2m of indirect gross output (turnover) by industries which supply inputs to the industries that provide goods and services to students; for example inputs of energy to student flats. Another \$3.9m of induced turnover is generated by the spending of wages and salaries earned by people employed in the various supplying industries. (The induced effect also incorporates all of the next and subsequent waves of indirect and induced effects which arise out of the first wave of induced effects).

Although the gross output multiplier raises the initial effect by more than 50%, this does not equate to the effect on regional gross domestic product. Removing the double counting yields a total net effect of \$13.9m.

Looking at this \$13.9m in relation to the funding provided by the trusts yields a leveraging ratio of 5.8:1, considerably above the 2:1 ratio previously estimated for 2001.

## **Employment**

Employment directly attributable to the zero fees policy is about 170 full time equivalent positions. Multiplier effects raise this to 266.

A caution is in order here. It is possible that some industries can increase output without taking on more staff and perhaps even without increasing hours worked (and thus wages paid). For example in 2001 SIT anticipated that existing staff capacity could absorb some of the projected increase in student numbers. To the extent that any industry has surplus capacity the economic impact of the zero fees policy will be over-estimated.

On the other hand, we have not allowed for any expenditure by students' family and relatives who may visit for graduation ceremonies or to help their sons and daughters settle in at the start of the academic year.

## Appendix A

### Mean Expenditure Composition of SIT Students

Industry	Students from elsewhere	Resident students remaining
	\$pa	\$pa
Horticulture and fruit growing	37	38
Meat and meat product manufacturing	319	326
Dairy product manufacturing	218	223
Other food manufacturing	424	432
Beverage, malt and tobacco manufacturing	457	565
Textile and apparel manufacturing	408	414
Printing , publishing & recorded media	81	104
Petroleum and industrial chemical manufacturing	252	261
Rubber, plastic and other chemical product manufacturing	48	49
Transport equipment manufacturing	43	45
Machinery & equipment manufacturing	185	242
Furniture and other manufacturing	195	201
Electricity generation and supply	614	550
Retail trade (incl margins)	433	437
Accommodation, restaurants and bars	762	1138
Road transport	100	183
Air transport, services to transport and storage	115	79
Communication services	461	469
Insurance	204	286
Real estate	1810	1561
Ownership of owner-occupied dwellings	411	884
Business services	230	359
Central government services	57	59
Education (excl government funding)	536	462
Cultural and recreational services	243	311
Personal and other community services	144	144
Tax (GST and excise)	<u>931</u>	<u>1085</u>
<b>Total</b>	<b>9718</b>	<b>10906</b>

## Appendix B

### Economic Impact Calculation

		Students from Elsewhere	Resident Students Remaining	Total
<b>Base Economic Values</b>				
Gross Output	(\$m)	10.1	6.9	17.0
Employment	(FTE)	106.2	72.4	178.6
Value Added	(\$m)	5.4	3.7	9.1
<b>Adjusted for Trade Diversion</b>				
Gross Output	(\$m)	9.6	6.6	16.2
Employment	(FTE)	100.9	68.8	169.7
Value Added	(\$m)	5.1	3.5	8.6
<b>Multipliers - Type I</b>				
Gross Output		1.32	1.32	1.32
Employment		1.39	1.32	1.36
Value Added		1.36	1.36	1.36
<b>Multipliers - Type II</b>				
Gross Output		1.56	1.55	1.56
Employment		1.60	1.52	1.57
Value Added		1.62	1.61	1.61
<b>Total Activity by Type I Multipliers</b>				
Gross Output	(\$m)	12.7	8.7	21.3
Employment	(FTE)	139.9	90.6	230.5
Value Added	(\$m)	7.0	4.8	11.8
<b>Total Activity by Type II Multipliers</b>				
Gross Output	(\$m)	15.0	10.2	25.2
Employment	(FTE)	161.6	104.5	266.2
Value Added	(\$m)	8.3	5.6	13.9