



INFOMETRICS

The Economic Impact of Foreign Fee-Paying Students

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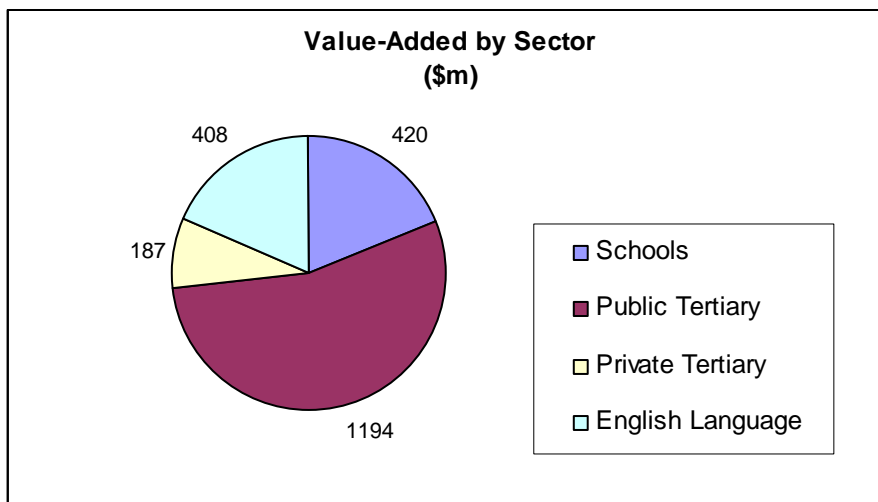
The Economic Impact of Foreign Fee-Paying Students

1. Summary

In a previous report we estimated the economic contribution of the export education industry (foreign fee-paying students studying in New Zealand educational institutions) to the New Zealand economy in 1999. The effect on Gross Domestic Product was estimated at \$545m. An update to the study estimated that by 2001 the effect of the export education industry on GDP had more than doubled to \$1250m.¹

For 2004 we estimate that the contribution of foreign education to GDP has passed the two billion dollar mark, with the industry's value-added estimated at approximately \$2210m, an increase of over 75% on 2001. Just over half of this is accounted for by students studying at public tertiary institutions. School students and English language students each contribute about a fifth of the total.

Figure 1
Total Contributions to GDP by Education Sector



2. Data

The main focus of the first report was to determine how much foreign fee-paying (FFP) students spend on living costs. Estimates were compiled using information from a number of different data sources, none of which were expressly designed for the purpose. It was noted at the time that better estimates would require a dedicated survey to be undertaken. Unfortunately, for the update undertaken in 2002 there were no new estimates of spending on living costs, so the earlier estimates were simply adjusted for consumer price inflation.

¹ Infometrics (2000) *Economic Impact Analysis of Foreign Fee-Paying Students*, report to Education International Marketing Network and Asia 2000 Foundation, October. And Infometrics (2002) *Economic Impact of International Education*, paper prepared for Education International Marketing Network, August.



There has still not been a dedicated survey of expenditure by FFP students. However, some progress has occurred thanks to the NZUSA which, in 2004 commissioned a survey of public tertiary students' income and expenditure. The sample included nearly 600 foreign students which is a reasonable basis for calculating expenditure on living costs, but does not allow any disaggregation by source country or location of study in New Zealand.²

We have no new data relating to expenditure on living costs by students at secondary and primary schools, English language schools (ELS) or other private tertiary providers (PTP). A recent study by Venture Taranaki, however, estimates that expenditure on living costs by foreign secondary students is 75% of that by foreign tertiary students.³ We assume that this proportion is valid at a national level.

For ELS students it is assumed that average expenditure is the same proportion of average expenditure by public tertiary students that prevailed in 1999.

For PTP students, expenditure on living costs is assumed to be the same as expenditure by public tertiary students, although the former group's average course length is about 8% longer. In comparison, the average course length at ELS is 31% of that at public tertiary institutions, but the implied ratio of expenditure on living costs is 43%, suggesting that some aspects of expenditure do not change in proportion to course length. Indeed the NZUSA survey is based on precisely this principle, asking about weekly expenses and annual expenses. For expenditure by PTP students relative to expenditure by public tertiary students, this effect is unlikely to be substantial.

The composition of expenditure is assumed to be the same in all cases. Clearly this is not correct; tertiary students are likely to spend more on entertainment than secondary students, secondary students stay longer and so on. However, we expect such differences to have only a second order impact on the overall results.

As a result of data collected by the Ministry of Education in connection with the Export Education Levy we have new data on:

- the number of FFP students by sector
- the cost of tuition by sector

Table 1 shows the estimated expenditure on tuition and living costs.

We caution that this data applies to New Zealand as a whole. Applying the averages for tuition costs and living costs to student numbers in specific regions may generate unacceptable error margins. For example one would not expect expenditure by tertiary students in Hawkes Bay to be the same as that by tertiary students in Auckland. Nor is the institutional composition of tertiary students (universities versus polytechnics and institutes of technology) likely to be same in each region.

² The survey was undertaken by TNS. It covered students at universities, polytechnics and colleges of education. We are grateful to TNS for supplying us with expenditure data for foreign tertiary students.

³ Venture Taranaki and Education Taranaki International (2005) *International Education Students in Taranaki 2004: Economic Impact Study*.



Table 1
Expenditure by Foreign Fee-Paying Students

		Schools	Public Tertiary	Private Tertiary	English Language	Total
Number of Students	No.	18322	41540	7681	45129	112672
Tuition	\$m	154.6	438.9	65.1	116.8	775.3
of which levies	\$m	0.8	2.0	0.3	0.5	3.7
Average tuition (excl levy)	\$/student	8391	10518	8429	2575	
Average living cost	\$/student	11070	14851	14851	6431	
Imports	\$/student	599	803	803	348	
GST	\$/student	758	1016	1016	440	
Net	\$/student	9713	13031	13031	5643	
Total living costs	\$m	202.8	616.9	114.1	290.2	1224.0
Total Expenditure	\$m	357.4	1055.8	179.1	407.0	1999.3
	%	17.9%	52.8%	9.0%	20.4%	100.0%
GST plus levies	\$m	34.0	99.1	16.3	35.0	184.4

3. Methodology

The economic impact of foreign fee-paying students has three main components:

- expenditure on tuition fees,
- expenditure on living costs,
- the flow-on effects of both areas of expenditure on the wider economy.

The methodology used for this study is commonly accepted for economic impact analysis. It uses the concept of an economic multiplier, as explained in Appendix A.

Multipliers have been derived for services to foreign education by weighting individual industry multipliers by the composition of expenditure by foreign students.

Essentially this corresponds to deriving a synthetic industry - Foreign Education Services (FES) - one which is not actually defined in the national accounts, but which represents an amalgamation of a collection of different industries such as education, restaurants. The multipliers so derived are shown in Table 2 in the following section.⁴

Multipliers are not applied to the GST and education levy components of student expenditure. This is because the multipliers are not sophisticated enough to capture how the government allocates its tax revenue. To do so would necessitate the use of a general equilibrium model, as explained in Appendix A.

4. Results

The results are shown in Table 2. Because the balance of expenditure between tuition fees and living costs differs slightly between different types of student, the multipliers also differ between types of student.

⁴ The multipliers pertain to 2000/01 and were calculated by Butcher Partners.



**Table 2
Economic Multipliers and Results**

		Schools	Public Tertiary	Private Tertiary	English Language	Total
Number of Students	No.	18322	41540	7681	45129	112672
<u>Expenditure (excl GST)</u>						
Tuition (excl. levies)	\$m	154	437	65	116	772
Living Costs (excl. imports)	\$m	<u>178</u>	<u>541</u>	<u>100</u>	<u>255</u>	<u>1074</u>
		332	978	165	371	1846
Labour / gross output	No./\$m	12.6	8.6	11.5	10.4	
Value-Added / gross output	\$/ \$	0.58	0.53	0.45	0.44	
Employment	No.	4176	8455	1890	3844	18365
Value-Added	\$m	192	520	74	162	949
<u>Multipliers - Type I</u>						
Gross Output		1.45	1.54	1.63	1.61	
Employment		1.58	1.66	1.71	1.76	
Value-Added		1.48	1.55	1.70	1.71	
<u>Multipliers - Type II</u>						
Gross Output		2.15	2.22	2.26	2.21	
Employment		2.04	2.22	2.19	2.27	
Value-Added		2.01	2.10	2.31	2.30	
<u>Activity by Type I Multipliers</u>						
Gross Output	\$m	482	1507	268	599	2856
Employment	No.	6580	14048	3233	6777	30639
Value-Added	\$m	284	805	126	278	1493
<u>Activity by Type II Multipliers</u>						
Gross Output	\$m	713	2169	372	818	4072
Employment	No.	8506	18746	4138	8711	40101
Value-Added	\$m	386	1095	171	373	2025
GST & Levies	\$m	34	99	16	35	184
Value-Added + GST & Levies	\$m	420	1194	187	408	2210
	%	19.0%	54.0%	8.5%	18.5%	100.0%

Output and value-added

The direct foreign exchange earnings attributable to foreign students total an estimated \$1.8 billion, corresponding to tuition fees of \$780m and expenditure on other goods and services (living costs) of \$1100m. This generates a further \$1010m of indirect turnover (gross output) by industries that supply inputs to the FES industries; for example inputs of energy to educational institutions. Another \$1200m of induced turnover is generated by the spending of wages and salaries earned by people employed in FES and those employed in the industries which supply FES. Note that the induced effect also subsumes 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 for FES more than doubles the initial effect, this does not equate to the effect on GDP. Stripping out the double counting leaves a total contribution to GDP of \$2.21 billion. This is an extra \$0.20 for every \$1.00 earned directly.



The estimated direct, plus indirect, plus induced value-added effect of \$2.21m represents about 1.5% of total GDP. In comparison the Oil & Gas Exploration & Production industry accounts for about 1.0% and Forestry Processing for about 2.0%. In 1999 foreign education accounted for only 0.5% of GDP.

Employment

Employment directly attributable to foreign student expenditure is over 18,000 full time equivalent positions. Multiplier effects raise this to about 40,000. Of the direct effect, about 65% is accounted for by the education industry. Thus one could claim that for every job generated directly in the education industry (through having foreign fee-paying students in New Zealand) another 2.3 FTE jobs are generated elsewhere - approximately 0.5 jobs in industries which directly supply goods and services such as food and transport to students, another 1.0 jobs in industries which supply those industries and the education industry, and another 0.8 in the industries which benefit from the associated increase in consumer spending power.

Employment in the education sector is calculated by applying labour-output ratios to the value of tuition expenditure. This will yield a reasonable estimate of direct employment only if a foreign student is not being asked to pay for more *per unit of service delivered* than government provides for a domestic student, and that the fee is based on average costs. The Italicised words are important. A higher fee may be charged without affecting the validity of the calculations if a foreign student actually costs more to teach, such as if they receive supplementary language tuition.

5. Caveats

As noted in Section 2, there is a dearth of data on expenditure on living costs by other than public tertiary students. We have previously investigated a number of possible sources for data on spending by foreign fee-paying students,⁵ but the only one of any real use is the NZUSA student survey, although it is not designed specifically to measure spending by foreign students.

While the Export Education Levy has (inadvertently) provided a rich source of information on student numbers and tuition fees, which has vastly improved our ability to measure the size of the industry and its wider economic impact, without reliable data on living cost expenditure these estimates will continue to have an unsatisfactory error margin. A dedicated survey run by a specialist market research organisation will not be cheap, especially if robust results by sector and by region are desired. It is, however, the number one priority for gaining a better understanding of the economic impact of export education.

Two other limitations of the results should be noted.

1. Employment income earned by foreign students during their stay in New Zealand is ignored. This may generate additional indirect economic effects over and above those estimated above, even though any income so obtained does not increase net national foreign exchange earnings.
2. There is no allowance for associated tourism; notably spending by friends and relatives of students who may come for graduation ceremonies or to help students to set up at the start of the academic year.

⁵ This includes the International Visitor Expenditure Survey, the Household Economic Survey, data collected by MFAT, the survey of English Language Providers and one-off surveys by various regional economic development agencies and research students.



Appendix A

Economic Impact Analysis

Introduction

The economic contribution of an industry does not mean that the economy is better off by the full amount of the measured contribution. This would only be true if all of the resources involved in supplying the needs of that industry would otherwise lie idle. This is unlikely, but usually we have no idea of what the most plausible counterfactual would be.

However, measurement of the economic contribution of foreign students differs in one important respect from measurement of the economic contribution of say a new shopping mall. In the latter there is distinct shift in the spending of local consumers - towards the new mall and away from existing establishments. Thus there is definite 'trade diversion' effect. With foreign students the demand comes from offshore (like an export) so there is no 'trade diversion' effect emanating from the demand side. Hence we do not allow for such an effect in the economic impact analysis. Nevertheless, as stated above, this is not to imply that the relevant resources would be idle if there were no foreign students.

The Multiplier Concept

Each dollar spent on the output of one industry leads to output increases in other industries. For example for a university to deliver education services to a foreign student it requires inputs of books, energy, communication services and so on. Part of the tuition fee 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 number called a Type I multiplier which is defined as the ratio of the direct plus indirect effects, to the direct effect.

The supplying industries pay wages and salaries, which are used to purchase household consumption goods. This effect is generally known as the downstream or induced consumption effect. Again the effect may be measured by a multiplier. The total or Type II multiplier is defined as the direct, plus indirect production, plus induced consumption effects, all divided by the direct effect.

Multipliers are typically calculated for three different measures of economic activity:

- gross output
- value-added
- employment

Each of these is further disaggregated into Type I and Type II multipliers.

However, multipliers need to be cautiously interpreted and carefully applied. When applied to gross output they lead to double counting. For example the value of food and drink supplied at a restaurant is counted as part of the gross output of both the Food and Beverage Manufacturing industry and the Restaurant industry. If one's aim is to measure overall business activity this double counting may be useful, but from



the perspective of economic contribution it is value-added, or contribution to gross domestic product (GDP) which is of interest.

Link to National Accounts

At this point one needs to be mindful of the definition of value-added and of the income-expenditure identity in the national accounts. If a foreign student spends \$100 in New Zealand, that \$100 is part of exports which is a component of final demand - the expenditure side of GDP. In this sense it represents 100% value-added. On the income side, however, only the part which is not spent on inputs from other industries is counted as direct value-added. The rest is progressively spent and re-spent upstream and, apart from spending on imports, is eventually entirely exhausted on inputs of labour and capital; that is value-added.⁶ Thus the multiplier for the indirect upstream effects is just a representation of the process whereby the expenditure and income sides of the national accounts equilibrate. No additional value-added is created from this effect. All that we gain is knowledge about how the initial expenditure shock ripples through the various supplying industries and how much leaks offshore.

The more powerful effect is that of the induced consumption multiplier. The initial wage and salary payments and the subsequent rounds of wage and salary payments lead to an increase in private consumption; another component of final demand. This generates flow-on effects in an analogous manner to the original increase in exports and therefore does generate an additional gain in GDP. This gain may be legitimately attributed to the increase in exports, provided that resources have not been diverted from other productive uses. If they have, it is necessary to deduct the direct, indirect and induced effects of those resources in their alternative uses.

Determination of Multipliers

Multipliers for the indirect production effect are easily calculated from standard input-output tables produced by Statistics New Zealand. Thus for a given increment to final demand (exports, consumption etc), we can determine the direct and indirect pattern of production needed to support that increment to final demand.

Consumption induced multipliers are more complicated to determine as they require some assumptions about the links between the Production Account and the Income & Outlay Account in the national accounts. In particular a link between private consumption (mostly household spending) and income from wages and profits needs to be established. Typically this is accomplished by treating inputs of labour as an intermediate input and then treating private consumption as the industry which produces labour. Enhancements to this approach include allowing for the distribution of operating surplus to households and for the leakage of household savings. This is the essence of the approach used by Butcher Partners (whose multipliers we use) to calculate the indirect production and induced consumption multipliers.

Other enhancements are possible:

- allowing for income leakages via taxes linked to consumption injections via income from welfare benefits;
- including the effect of government consumption, much of which, such as health, is actually consumed by individuals and paid for out of taxes;

⁶ In fact value-added also includes some forms of indirect taxation.



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- including the effect of new investment which may be needed to expand output and may be financed out of operating surplus;
 - acknowledging that exports may need to rise to finance the requirement for additional consumer imports.

Accounting for all of these effects requires the use of a multi-industry general equilibrium model. These types of models incorporate all of the inter-dependencies in the economy, such as flows of goods from one industry to another, plus the passing on of higher wage costs in one industry into prices and thence the costs of other industries. It also ameliorates most of the other implicit assumptions that are commonly overlooked in the application of multipliers derived from static input-output tables, notably:

- it does not assume that all factors of production are in excess supply,
- it allows for price changes (such as if a factor is in limited supply) which may lead producers to change inputs, thereby altering their production structure and hence the associated economic multipliers,
- it does not force average relationships to hold at the margin,
- it automatically calculates net multiplier effects by reducing the gross effects to the extent that they pull resources out of other productive uses (that is trade diversion).

All of these effects have the potential to undermine the result of multiplier analysis - the wider the attempted coverage of indirect and induced effects, the greater is the potential for miscalculation and error. Rather like a stone thrown into a pond; the more the ripples spread out, the more likely they are to encounter some form of obstacle - ripples from another stone, a cross current, the embankment.

Given the size of the export education industry a general equilibrium model analysis of the industry's wider economic impacts would seem very worthwhile, but not until there are better estimates available of expenditure on living costs by all foreign fee-paying students.