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AN INPUT/OUTPUT ANALYSIS OF OVERSEAS STUDENTS STUDYING AT AUSTRALIAN UNIVERSITIES

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ABSTRACT

In a paper by McKay and Lewis (1993), average annual expenditure by overseas students at the University of Wollongong was estimated. These estimates are the starting point of this paper. In contrast, this paper examines the multiplier effects of Wollongong overseas student expenditure on the Wollongong economy. From this, it makes inferences on the extent of spending by overseas students enrolled in Australian universities and predicts the likely national economic impacts. In establishing the multiplier effects, overseas students expenditure is applied to the input/output technique, which was pioneered by Leontief. Total overseas student spending is calculated for Wollongong and Australia, classified by sector[1] and then applied to Wollongong and national input/output tables. This provides output, income and employment predictions. This paper estimates that in 1992, the 1239 overseas students studying at the University of Wollongong created 705 full-time equivalent jobs, while the 39,490 overseas students studying at Australian universities generated 30,036 jobs. This study applies only to overseas students enrolled at Australian universities and not those at high schools, TAFE or ELICOS colleges[2].

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1 As this paper is an input/output study, by convention 'industries' are referred to as 'sectors'. However, the author is aware that a 'sector' is technically a 'grouping of transactors by institutional type of transactor'and an industry is a 'grouping of establishments according to the type of economic activity engaged in by the establishment' (Jackson, D., 1989, p. 11, p. 205).

2 Colleges of **Technical and Further Education**; Colleges of **English Language Intensive Courses for Overseas Students**.

Introduction

The second half of the 1980s has shown rapid expansion in enrolments by overseas students at Australian universities. Table 1 shows this is the case for the University of Wollongong and other Australian universities. Growth has occurred for Full fee paying students with a real decline in the number of Australian government sponsored students. The dramatic growth overall in student enrolments generates questions regarding the social, cultural and economic impacts on Australia of these students. The contribution of this paper is to analyse the multiplier economic impact caused by these students' expenditure in 1992.

Table 1. Growth in the number of overseas students studying at Australian universities

	Overseas Students Studying at:			
	The University of Wollongong		All Australian Universities	
	1986	1992	1986	1992
Full fee paying students[a]	0	1030	0	30296
Australian government-sponsored students[b]	692	209	16782	9194
Total	**692**	**1239**	**16782**	**39490**

(a) Includes those students supported by family, friends, or an overseas government or company.

(b) Includes students sponsored by the Department of Education, Employment and Training (DEET), and by the Australian International Development Assistance Bureau (AIDAB).

Source: DEET, *Selected Higher Education Statistics*, Canberra, 1992, table 12; Planning and Marketing Department, University of Wollongong.

Overseas student expenditure estimates for this paper were taken from McKay and Lewis (1993), which estimated average overseas student annual expenditure, and categorised and discussed results by various demographic factors. Results were obtained from surveying students and the methodology adopted in that paper is now discussed.

In September 1992, a census of expenditure was conducted with the 1239 overseas students attending the University of Wollongong. Questionnaires were mailed to students and 413 were returned. Estimates of living and entertainment spending were provided by students and grouped into two main categories: goods and services usually purchased on a weekly basis and those usually purchased on an annual basis.

A question on weeks spent at their Australian residences allowed yearly expenditure to be derived, and average total expenditure for all students calculated. No weighting of the results was necessary as the proportion of students by nationality, type of fees funding and student status from the returned questionnaires closely reflected those for the total overseas student body. Table 2 presents the results which are grouped into six categories of expenditure. Further disaggregation into 33 minor categories is presented in Appendix 1.

From Table 2, the average student expenditure for the year 1992 was $25,526. This includes $15,710 on living and entertainment expenses derived from the student census, and $9816 in University fees. The average fees estimate was calculated from 1992 international fees revenue data provided by the Finance Department at the University of Wollongong. Fees represent 38 per cent of total expenditure; other major expenses include total food expenditure 14 per cent, rent 13 per cent, airline travel 5 per cent and communications 4 per cent (refer to Appendix 1).

Table 2. Average expenditure of an overseas students at the University of Wollongong within Australian, 1992

Expenditure	Annual Spending $
Accommodation	4785
Food	3491
Transport and Travel	2802
Personal Expenses	2184
Communication	1263
Education Expenses	1185
Total Living and Entertainment Expenses	15710
University Fees (a)	9816
Total Student Expenditure	**25526**

Note: Figures based on 413 questionnaires returned from overseas students studying at the University of Wollongong, 1992.

(a) Average calculated from 1992 overseas fee revenue obtained from the University of Wollongong, Finance Department.

Source: McKay, D. and Lewis, D. (1993), table 2.

Grouping Expenditure by Sector

Three steps were taken to convert student expenditure by type, to expenditure by sector for application to the input/output process:

1. Separate from average student expenditure that expenditure which occurred in the Wollongong region and multiply the results by the 1239 overseas students studying at the University of Wollongong in 1992. This was possible as the questionnaire asked students to provide spending estimates on each item inside and outside the Wollongong region, which allowed for this procedure.

2. Transform expenditure by type of goods and services in the Wollongong region into ASIC[3] classifications. The classification schedule used is tabulated in Appendix 2. As an example, expenditure on bath soap is classified into the chemical manufacturing sector. Furniture is classified into wood manufacturing, while car registrations are grouped into the public administration sector. Classifying items into sectors was by source of production. By convention, this is to capture the complete economic linkages from production to distribution when sector expenditures are applied to the input/output process.

3. Retail margins for seven sectors were re-allocated to the retail/wholesale sector. The national input/output tables (Catalogue 5209, table 4) for 1986/87 were used for this process. This was adopted for sectors such as clothing/footwear where students would have actually purchased items in this category through the retail/wholesale sector. Sectors with retail margins reallocated are indicated with an asterisks in table 3.

The 1239 overseas students at the University of Wollongong spent $31.6 million in Australia in 1992. Table 3 indicates that $28.2 million in expenditure by these overseas students actually entered the economy of Wollongong. The expenditure is disaggregated into 31 sectors, which are equivalent to those for a Wollongong input/output table. This table is used in this report to derive the multiplier effects of overseas students expenditure in Wollongong.

The university sector has been separated from the education sector and is the major recipient of total overseas student spending. Other notable recipients include food manufacturing, retail/wholesale, finance and property, communication and entertainment.

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3 Australian Standard Industry Classification

Table 3. Overseas student expenditure in the Wollongong region by ASIC classifications for 1992

	Sectors	Spending in Wollongong ($000)	
1.	Agriculture	605.3	*
2.	Coal	—	
3.	Other Mining	—	
4.	Food Manufacture	1299.3	*
5.	Textile/Clothing/Footwear	203.5	*
6.	Wood Manufacture	101.9	*
7.	Paper Manufacture	255.5	*
8.	Chemicals Manufacture	193.3	*
9.	Clay/Non Metallic Minerals	—	
10.	Basic Metals	—	
11.	Non Ferrous Metals	—	
12.	Fabricated Metal	—	
13.	Machinery Manufacture	479.2	*
14.	Miscellaneous Manufacture	—	
15.	Electricity/Gas	534.0	
16.	Water/Sewerage	—	
17.	Construction	—	
18.	Retail/Wholesale	5609.8	
19.	Road Transport	—	
20.	Rail/Air Transport	396.7	
21.	Water Transport	—	
22.	Communication	1253.8	
23.	Banking	—	
24.	Non Bank Finance	—	
25.	Other Finance/Property	4333.4	
26.	Public Administration	85.5	
27.	Health	—	
28.	Education	—	
29.	Welfare/Religion	—	
30.	Entertainment/Recreation	674.2	
31.	University	12162.5	
32.	Household	63.3	
	Total	**28251.2**	

Note: The table includes Wollongong expenditure of 1,239 students.
* Sectors with retail margins reallocated.

Application To The Wollongong Input/Output Table

Table 3, with the exception of the university sector, presents the sector categories of the unadjusted Wollongong input/output table. The table was initially constructed by Mangan and Guest (1983) to analyse the regional effect of the downturn of the Port Kembla steelworks. In 1986, it was adapted to include full time equivalent (FTE) employment estimates. The last major update to any sectors occurred with the retail sector, after a study of that sector, in the Wollongong region in 1987.

As no major updates were performed on the table after 1987, it was necessary to update key sectors to improve this study's reliability. New turnover and FTE employment statistics were established for fourteen of the original thirty sectors in the table. This occurred through gathering financial and employment data from business establishments in Wollongong. Information was also collected and utilised from the Australian Bureau of Statistics (ABS) and the Illawarra Regional Information Service (IRIS). Of the updated sectors, seven were for those receiving direct overseas student spending. These were retail/wholesale, food manufacture, communication, entertainment, electricity/gas, rail transport and chemical manufacture. The updating of these sectors used the RAS method.[4] In addition, a university sector was created separately to that of the education sector by applying Wollongong University's income and expenditure patterns to the model. In doing so, University turnover was deducted

4 The RAS procedure is a bi-proportional iterative adjustment method designed to modify a base matrix to fit new row and column totals (West, 1992, p.89). In respect to the Wollongong input/output table, columns and rows were adjusted to the new row and column totals, while causing minimal disturbance to original multipliers.

from the education sector which previously incorporated it. Constructing a new University sector provides a more accurate assessment of the direct and flow-on effects from payment of student fees, rather than placing them into a broader education sector. This was particularly important as the university received 38 per cent of total student expenditures.

Input/Output Results

Expenditure by overseas students in Table 3 were applied to the updated 1992 Wollongong input/output table, and a summary of results is presented in Table 4.

Final demand estimates are the expansion in output required to supply the initial demands of overseas students. This will be equal to the actual student expenditure amount. These sectors that are direct recipients of student spending in turn demand outputs from other sectors to replenish their inputs. The expansion of these other sectors' output represents the industrial flow-on effect. Output generated requires increasing labour hours leading to income and employment expansion. As accumulated income is spent in the local economy, it induces further output expansion, summarised in the consumption effect. From table 4, total output generated after the multiplier effect by overseas students at the University of Wollongong was $58.2 million. This output created $15.7 million in income earnings for Wollongong residents and 705 FTE jobs. This job estimate would be higher if full-time and part-time employment was counted. These benefits derive from the initial $28.2 million of overseas student expenditure in the Wollongong economy. On a per student basis, each overseas student on average creates $47,040 in output, $12,733 in income and 0.57 FTE jobs.

Table 4. Student spending impacts on the Wollongong region, 1992 ($000)

	Final Demand (initial spending)	Industry Flow On	Consumption Effect	Total	Multiplier[a]
Output	28,187	12,328	17,765	58,282	2.1
Income	8,804	2,746	4,225	15,776	1.8
Employment (FTE)[b]	340	144	220	705	2.1

(a) Total divided by final demand, commonly referred to as the 2a multiplier.

(b) One FTE job equals 39 hours worked per week.

Note: Only expenditures injected into the Wollongong sectors are counted in the final demand output effects. Overseas students spending on private households from table 3 is excluded. This is why $28.187,000 and not $28,251,200 appears as the final demand output estimate.

Disaggregated sector effects are shown in table 5. This table provides only the total effects by sector, using the Type 2a multiplier. Final demand, industrial flow-on and consumption effects for each individual sector have not been shown, as the resultant table would be large and cumbersome to read. However, subsequent discussion will refer to them, in elaborating on total effects for notable sectors. For output, income and employment the major beneficiaries are the retail/wholesale, university and finance/property sectors, and to a lesser extent the communication, entertainment and construction sectors. Table 5 estimates that $12.3 million in output has been created at Wollongong University from student spending. Of this, 98 per cent was attributed to final demand effects or initial expenditure on the overseas students fees. One FTE job was created at the university for each $79 thousand in income generated. This is obtained by dividing

the total turnover of the University into its total FTE jobs. Therefore it is estimated that the $12.3 million created at the University by the 1239 overseas students has created 156 FTE jobs in that sector.

Of total output and employment benefits, the university derived 22 per cent of these benefits. The retail/wholesale sector received 27 per cent of output and employment benefits. However of this, 45 per cent was from consumption induced effects, which accounted for 88 of the 195 FTE jobs created. In this case, student spending generated employment and therefore incomes in various sectors, which was spent by residents largely in the retail/wholesale sector.

A portion of the increases in sector income from final demand and industrial flow on effects was also utilised by people to pay for accommodation. Consequently, the finance and property sector, which incorporates accommodation, had 33 per cent of its output and employment benefits generated from these consumption induced effects. Similarly 46 per cent of output and employment are from consumption induced effects for entertainment and recreation. Finance and property and entertainment/recreation contribute 11 per cent and 8 per cent to total employment respectively.

Of note is the fact that the total of manufacturing from sector 4 to 14 contributed only 10 per cent of total output and 7 per cent of total FTE jobs. Of the 51 FTE jobs created in manufacturing, 32 per cent were generated from consumption induced effects. Wollongong manufacturing is specialised in steel production and fabrication. A broader manufacturing base would have generated greater consumption induced effects for manufacturing, as presently increased demand for consumer manufacturing items are largely met by imports.

Finally, the consumption induced effects are largely attributable to income generated by the university and the

Table 5. Total overseas student impact on the Wollongong economy by sector for 1992

	Sectors	Output ($000)	Income ($000)	Employment (FTE)
1.	Agriculture	864	56	25.20
2.	Coal	185	49	1.20
3.	Other Mining	34	5	0.20
4.	Food Manufacture	2071	266	10.20
5.	Textile/Clothing/Footwear	510	107	7.40
6.	Wood Manufacture	259	40	3.30
7.	Paper Manufacture	678	119	7.20
8.	Chemicals Manufacture	394	47	1.90
9.	Clay/Non Metallic Minerals	201	37	2.40
10.	Basic Metals	205	29	1.00
11.	Non Ferrous Metals	59	6	0.20
12.	Fabricated Metal	296	59	5.00
13.	Machinery Manufacture	1138	155	11.10
14.	Miscellaneous Manufacture	77	10	1.30
15.	Electricity/Gas	1475	151	3.90
16.	Water/Sewerage	772	186	4.90
17.	Construction	1117	177	32.10
18.	Retail/Wholesale	15857	4433	195.00
19.	Road Transport	686	119	16.00
20.	Rail/Air Transport	729	292	10.10
21.	Water Transport	36	19	0.60
22.	Communication	2681	1074	24.60
23.	Banking	1825	713	12.30
24.	Non Bank Finance	2153	292	7.30
25.	Other Finance/Property	8699	613	76.60
26.	Public Administration	230	65	5.20
27.	Health	557	237	14.70
28.	Education	173	109	3.50
29.	Welfare/Religion	219	106	7.60
30.	Entertainment/Recreation	1742	524	56.70
31.	University	12360	5681	156.60
	Total	**58282**	**15776**	**705.30**

Note: Only total effects presented., based on the type 2a multiplier.

retail/wholesale sector. The university distributes an average 46 per cent of each dollar received in income. In 1992, it received $12.1 million in overseas student fees of which it is estimated $5.5 million is distributed in income generating consumption induced effects in other sectors.

Refering to Table 1, 1030 of the total 1239 students were full fee paying students. It is therefore estimated that 83 per cent of the benefits to Wollongong from overseas students are from full fee paying students, while Australian government sponsored students provide 17 per cent. This assumes that both types of students have equivalent spending patterns. From the student census, annual spending patterns for both groups for living and entertainment were similar at $15,755 and $15,224 respectively.

National Benefits

In 1992, there were 39,490 overseas students studying at Australian universities. Assuming each student possessed the same expenditure pattern as the average University of Wollongong student, national student expenditure is estimated to be $1,008 million. This assumption is regarded as reasonable. The cost of living and student fees in Wollongong may not be as high as those for students in a major city like Sydney. However, it may not be as low as for students in a provincial centre such as Wagga Wagga. Therefore, Wollongong student expenditure may closely approximate the national average. National estimates by sectors are presented in Table 6. It was constructed by multiplying the average Wollongong University student expenditures in Australian from Table 2 by the number of total overseas university students in Australia and converting spending by type of good or service to ASIC classifications. Retail margins are then

Table 6. Estimated national expenditures by overseas students in Australian universities (expenditures grouped by ASIC classification), 1992

	Sectors	Australian Spending ($000)
1.	Agriculture	22175.1
2.	Mining	—
3.	Manufacturing	93861.5
4.	Electricity/Gas/Water	18441.8
5.	Construction	—
6.	Retail/Wholesale	227605.4
7.	Transport	16941.2
8.	Communication	44584.2
9.	Finance	152510.4
10.	Public Administration	3238.2
11.	Community Services	387648.8
12.	Entertainment/Recreation	38621.2
	Sub total	**1,005,627.8**
	Household	2408.9
	Total	**1,008,036.7**

Note: Based on 39,490 overseas students in Australia. This table assumes that all overseas students in Australia have the same expenditure pattern as University of Wollongong students.

reallocated to the retail sector. For reasons of compatibility, expenditures by sector are required to be classified at the one digit ASIC level. Only at this level could FTE employmentestimates be obtained and incorporated into the national input/output table for this impact analysis. Due to the greater aggregation relative to the Wollongong study, some accuracy is compromised. The aggregation of the 31-sector Wollongong classification into the 12-sector Australian

classification is presented in Appendix 3.

National expenditures were applied to the 1986/87 Australian input/output tables to establish national output, income and employment effects. Employment estimates for the table are calculated as one full time equivalent job being equal to thirty nine hours worked per week. Applying Table 6 to the 1992 updated Australian table yields impact estimates in Table 7. From table 7, the $1008 million direct overseas student expenditure in Australia is estimated to generate $2744 million in total output. This turn produces $855 million in income and 30,036 FTE jobs. On a national level, each student creates on average $69,495 in output, $21,660 income and 0.76 FTE jobs.

Table 7. Overseas student spending impact on the Australian economy, 1992 ($000)

	Final Demand	Industry Flow On	Consumption Effect	Total	Multiplier[a]
Output	1005627	519451	1219311	2744390	2.7
Income	414395	120640	320335	855371	2.1
Employment (FTE)[b]	12870	4605	12561	30036	2.3

(a) See table 4

(b) One FTE equals 39 hours worked per week.

Disaggregated national effects by sector are presented in Table 8. As with the Wollongong impact estimates, only total effects by sector deriving from the 2a multiplier are shown. However, subsequent discussion will mention final demand, industrial flow-on and consumption effect components, where

applicable. After allowing for greater aggregation of sectors, sector contributions on the national level approximate those estimates for Wollongong. This is not surprising considering student spending patterns from the Wollongong study have been applied to the Australian input/output table providing national predictions.

As with the Wollongong study, retail/wholesale and the university sector (which is incorporated into community services), were the major beneficiaries. Eighteen per cent of total output was generated in the retail/wholesale sector and 17 per cent in the community services sector. For employment, the proportions were 28 per cent and 22 per cent respectively. As with the Wollongong study, finance and entertainment/recreation were also notable recipients. Both had output and employment contributions approximating that for the Wollongong study. Note that the finance sector in Table 8 includes finance and property, bank and non-banking finance sectors from the Wollongong study.

In contrast to estimates for Wollongong, manufacturing benefitted much more at the national level, receiving 21 per cent of output and 11 per cent of employment. Total manufacturing in Wollongong (sectors 4 to 14) received only 10 per cent of output and 7 per cent of employment. This suggests the broad manufacturing sector nationally was more able to meet consumption induced demand than the more specialised manufacturing sector in Wollongong, demonstrated by the fact that consumption induced effects for Wollongong were 32 per cent of the total manufacturing employment, while nationally the proportion was 56 per cent.

Table 8. National impact of expenditure by all overseas students at Australian universities by sector for 1992 ($000)

	Sectors	Output	Income	Employment
1.	Agriculture	85119	10097	1382.7
2.	Mining	41815	7201	149.6
3.	Manufacturing	576519	104903	3375.5
4.	Electricity/Gas/Water	119511	25166	479.9
5.	Construction	19980	4774	161.8
6.	Retail/Wholesale	502855	163718	8485.6
7.	Transport	112685	38387	1212.4
8.	Communication	98195	32625	939.6
9.	Finance	557376	110245	4474.5
10.	Public Administration	16719	8231	185.3
11.	Community Services	473971	309530	6714.0
12.	Entertainment/Recreation	139645	40494	2474.9
	Total	**2744390**	**855371**	**30035.8**

Note: Includes only total multiplier effects.
Based on estimated spending by 39,490 overseas students in Australia.

Updating of the Australian Input/Output Table

The national input/output tables are only published once every four years, with the most recently obtainable being the 1986/87 national table. This table was updated to 1991/92 figures for its use in this study. The method of updating was to inflate the national input/output table by the proportional change in Gross Domestic Product (GDP) between 1986/87 and 1991/92. This allowed for price and quantity changes since 1986/87 which would have occurred in sector turnovers. In testing the updated table, it predicted a 1991/92 GDP amount

very close to the actual amount published for that year in the Australian national accounts. (From the national table, GDP, or National Value Added, is calculated by subtracting purchases from receipts, plus the change in stocks.) Though not adopted, a second method of adjusting the 1986/87 table is to inflate that table using a price deflator. Both methods would produce the same output and income predictions as obtained in Table 7. However, the second method in only adjusting for price effects generated exaggerated employment predictions. A resultant table using the price deflator also underestimated 1991/92 GDP. Employment estimates applied to this table (updated using method 1) were from the 1991 Census. 'Hours worked weekly by industry' was utilised to generate FTE employment estimates, though as mentioned this could only be established at the one-digit ASIC level.

The updated table also adjusted the turnover to employment ratio for the community service sector. This sector comprised the education, welfare and health sectors from the original disaggregated national table. The output multiplier for education closely mirrored that for the whole community service sector, which alleviated concerns of attaining reliable multiplier effects from student fees spending. However, the turnover to employment ratio for community services was notably lower than the actual university ratio provided by DEET statistics. Subsequently, the actual 1991 national university turnover to employment ratio was incorporated into the community service sector. This was necessary because this sector received 38 per cent of total student expenditure as university fees. These updating methods were adapted to produce reliable employment predictions, without affecting the sector output multipliers from the original 1986/87 national table.

It is not surprising that on a per student basis, the

Australian effects are greater than those for Wollongong. The national output multipliers are greater than those for a region such as Wollongong, as regional economies have inter-regional as well as international imports. Secondly, the initial spending impact by an average Wollongong University student on the Wollongong input/output table is less than the same average student's impact on the national input/output table. The average student from the Wollongong census spends 88 per cent of his/her Australian expenditures (refer to Table 2) in the Wollongong area. Only this amount is injected into the Wollongong input/output table per student.

Estimated Export Benefits

From Table 1, 30,296 of the 39,490 overseas students studying at Australian universities were full fee paying. On a *pro rata* basis, $776 million of direct student spending is estimated to be direct exports for Australia. This is the estimated foreign exchange injected into the Australian economy from overseas sources. These exports are predicted to generate a total of $2,113 million in output, $658 million in income and 23,127 FTE jobs for Australia.

Australian government sponsorship of 9,194 students generated $231 million in direct spending. Allowing for the multiplier effects, this was responsible for $631 million in total output, $196 million income and 6,908 FTE jobs. This reinjection of foreign aid has notable economic effects and may be considered as an export assistance.[5] In theory, this is no

5 Expenditure by Australian government sponsored students is a service export in the Australian Balance of Payments. The funding of this expenditure by the Australian government is a debit under Unrequited Transfers. Total expenditure is not necessarily completely funded by the Australian government.

different to those subsidies offered to grain exporters in the US economy.

Note that these estimates assume that a full-fee student's expenditure pattern is the same as that for a student sponsored by the Australian government. As such, results should be seen as approximations.

Limitations to Results

The accuracy of this study is restricted by the input/output techniques it adopted. Limitations of input/output modelling are well documented. It assumes an economy is operating at full capacity with constant returns to scale. The conventional table does not analyse the feedback effect of factors, such as induced inflation, interest rates or social security payment changes, as do some macroeconomic models. However, at a regional level, it is still the best technique available. In the case of the Wollongong Input/output table, its accuracy is also a reflection of the quality of the data collected and its processing.

In analysing the final impact results in Tables 4 and 7, the consumption induced effects should be viewed with some caution. Final demand and industrial flow on estimates represented the required expansion of the economy needed to supply the spending demands of students and can be viewed with more certainly. Consumption-induced effects derive from expanded output increasing employment and incomes, which in turn increases demand for further production of goods and services. However, as employment and income increase, people in the region are less eligible for government tranfer payments. This would reduce the income available to be re-injected into the economy, consequently diminishing consumption-induced effects. Therefore the total economic effect, as presented in this study, is likely to be exaggerated.

This issue was addressed by Mangan and Phibbs (1987).

With reference to student spending estimates, reliability is subject to sampling errors and data processing. Using a 95 per cent confidence level, student expenditure on living and entertainment in the Wollongong study varied from an upper limit of $16,243 to a lower limit of $15,177. Extending the analysis to obtain national estimates is more problematic as overseas students at the University of Wollongong make up only 3 per cent of overseas students nationally. Therefore results should be seen as indicative.

Finally, this report assumed all money spent by overseas student is from overseas sources or, in the case of Australian government sponsored students, the Australian government. Similarly, it is also assumed that the students under review are not employed or earning incomes in Australia. Clearly, this is not correct and further research is needed in this area, although in the Wollongong census, students reported only working an average 1.58 hours per week. This is not surprising, considering the industrial city of Wollongong has been particularly affected by the recession. Of course a cost benefit approach to this area would need to investigate whether overseas students are adversely affecting accommodation markets or the efficient education of Australian tertiary students. Conversely, they may be generating investment through saving in Australian financial institutions. These are all areas for future research.

Policy Implications

This report has demonstrated economic benefits to the Australian economy from spending by overseas students. As demonstrated in Table 1, there is strong demand by overseas students for higher education facilities, and there is no reason

to suspect that this demand will not continue. Given the potential for economic advantages, Australia needs to efficiently market its universities, in particularly exploiting its proximity to Asia.

Government should be aware that it is only by efficient, long-term planning that future benefits can be maximised. This could take the form of targetting countries whose students have higher annual expenditures and are least likely to absorb any employment they create through their spending in Australia.

Expanding student enrolments will benefit Australian macro and regional economies. On a macroeconomic level, there are gains to the ailing current account deficit. Expanding enrolment of full fee students at universities by 25,000 would, it is predicted, generate $638 million in 1992 exports. This would have reduced the 1991/92 current account deficit by 5 per cent, which for that year was $12,379 million. These export dollars would also be estimated to create 19,000 FTE jobs.

Optimising regional benefits may involve expanding enrolments of overseas students in areas in most need of economic stimulus. For instance, an additional 1000 overseas students enrolled at the University of Wollongong would create an additional $47 million in output and 570 FTE jobs. This would be an important economic fillip for an economy whose unemployment rate increased from 13.6 per cent in 1991 to 16.5 per cent in 1993.[6] If the 570 FTE jobs predicted were absorbed by 570 unemployed people in 1993, then the unemployment rate would fall to 16 per cent. In reality, the 570 positions would be a combination of full-time/part-time positions: in the latter case, up to 700 or more jobs may be

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6 From 1991 Small Region Census data and 1993 estimate from the Illawarra Regional Information Service.

created which would reduce the unemployment rate more substantially. Wollongong is an example of a regional economy particularly hard hit by the 1993 recession. It and others like it could benefit from government involvement in directing more students to its university, fostering regional economic growth and speeding recovery. In particular, the AIDAB allocation of sponsored students could be manipulated to pursue these goals of regional equity.

The reader should note that predictions in this section are generated on the average and not the margin. One extra student enrolled at the University of Wollongong is unlikely to generate an extra 0.57 FTE jobs; however, an extra 200 students are more likely to create 0.57 FTE jobs per student. The latter is much more likely to stimulate the market confidence, investment and consumer spending.

The accuracy of impact results presented in this paper reflect that of the Wollongong input/output table. This table, developed by Mangan and Guest (1983), was constructed using a hybrid approach of survey and non-survey techniques (refer to West, 1992). It was created to reflect holistic accuracy (refer to Jensen, 1980), that is, it represents the main features or structure of the Wollongong economy. For this reason, caution should be taken in analysing the precision of the impact results in this paper. These results should be viewed as scientific approximations, which are aimed at contributing to the normative debate surrounding the impact of overseas students in Australia.

Conclusion

Overseas students create positive economic effects regionally and nationally. Such students provide other benefits — economic and cultural — that are beyond the scope of this

report. These benefits include encouraging friends and relatives to visit Australia and the opening of future trade and diplomatic links with Australia as students take up responsible positions in commerce and government in their own countries. The debate about selling education to overseas students is a subjective one for many people. However, one must be aware that these students are customers who are paying for a service. The impression we leave with them in providing the service dictates whether the economic benefits outlined in this paper continue.

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APPENDIX 1

Average expenditure by overseas students at the University of Wollongong, 1992.

	Yearly $	Weekly $
Accommodation		
Rent	3309.50	69.01
Electricity	434.88	9.07
Gas	31.82	0.66
Furniture	175.56	3.66
Kitchen Utilities	62.17	1.30
Electric Equipment	770.97	16.08
Sub Total	**4784.90**	**99.77**
Food		
Meat and Milk	856.48	17.86
Groceries	1787.92	37.28
Fast Food	846.76	17.66
Sub Total	**3491.16**	**72.79**
Transport and Travel		
Car Purchase	217.46	4.53
Car Registration	82.10	1.71
Car Insurance	164.90	3.44
Car Maintenance	163.71	3.41
Petrol	258.36	5.39
Airline	1267.51	26.43
Travel	428.95	8.94
Holidays	218.41	4.55
Sub Total	**2801.40**	**58.41**
Communication and Other Services		
Communications	1128.52	23.53
Bank Charges	23.63	0.49
Financial Services	110.99	2.31
Sub Total	**1263.14**	**26.34**

	Yearly $	Weekly $
Personal Expenses		
Health	253.56	5.29
Clothing	398.96	8.32
Toiletries	357.63	7.46
Gifts	224.67	4.68
Videos	112.65	2.35
Entertainment	717.52	14.96
Sports Equipment	76.90	1.60
Club Membership	42.40	0.88
Sub Total	**2184.29**	**45.54**
Educational Expenses		
Text Books	396.75	8.27
Stationery	360.79	7.52
Photocopying	328.77	6.86
Tutoring	60.95	1.27
Child Education	37.85	0.79
Sub Total	**1185.11**	**24.71**
Total Living Expenses	15710.00	327.56
Student Fees	9816.38	204.68
Total Expenditure	**25526.38**	**532.24**

Note: Weekly Spending based on students' spending 47.96 weeks in Australia (Results from 413 surveys returned).

Source: McKay, D. and Lewis, D. (1993), table 2.

APPENDIX 2

The Reclassification of Expenditure by Type into Expenditure by ASIC grouping compatible with sectors in the Wollongong input/output table

ASIC Classification of the 31-sector Wollongong Input/Output Table		Type of Produce or Service
1.	Agriculture	meat and milk
2.	Coal	NA
3.	Other Mining	NA
4.	Food Manufacture	Groceries
5.	Textile/Clothing?Footwear	clothing
6.	Wood Manufacture	furniture
7.	Paper Manufacture	photocopying
8.	Chemicals Manufacture	toiletries
9.	Clay/Non-Metallic Mining	NA
10.	Basic Metals	NA
11.	Non-Ferrous Metals	NA
12.	Fabricated Metal	NA
13.	Machinery Manufacture	electrial equipment
14.	Miscellaneous Manufacture	NA
15.	Electricity/Gas	electricity and gas
16.	Water/Severage	NA
17.	Construction	NA
18.	Retail/Wholesale	kitchen utilities, fast food, car purchase, car maintenance, petrol, airline tickets, gifts, videos, sports equipment, textbooks, stationery, child education expenses

ASIC Classification of the 31-sector Wollongong Input/Output Table		Type of Produce or Service
19.	Road Transport	NA
20.	Rail/Air Transport	travel/rail
21.	Water Transport	NA
22.	Communication	communication — telephone and postage
23.	Banking	NA
24.	Non Bank Finance	NA
25.	Other Finance/Property	rent, bank charges, financial services, health insurance, car insurance
26.	Public Administration	car registration
27.	Health	NA
28.	Education	NA
29.	Welfare/Religion	NA
30.	Entertainment/Recreation	entertainment, holidays, club memberships
31.	University	university student fees
	Household	private tutoring

NA = No expenditure on Goods and Services classified into these sectors

APPENDIX 3

Grouping of 31-sector Wollongong Input/Output Table into 12-sector Australian Table

12-sector		31-sector	
1.	Agriculture	1.	Agriculture
2.	Mining	2.	Coal
		3.	Other Mining
3.	Manufacturing	4.	Food Manufacture
		5.	Textiles/Clothing/Footwear
		6.	Wood Manufacture
		7.	Paper Manufacture
		8.	Chemical Manufacture
		9.	Clay, Non-Metallic Minerals*
		10.	Basic Metals
		11.	Non-Ferrous Metals*
		12.	Fabricated Metals
		13.	Machinery Manufacture
		14.	Miscellaneous Manufacture
4.	Electricity/Gas/Water	15.	Electricity/Gas
		16.	Water/Severage
5.	Construction	17.	Construction
6.	Retail/Wholesale	18.	Retail/Wholesale
7.	Transport	19.	Road Transport
		20.	Rail/Air Transport
		21.	Water Transport
8.	Communication	22.	Communication
9.	Finance	23.	Banking
		24.	Non Bank Finance
		25.	Other Finance/Property

12-sector		31-sector	
10.	Public Administration	26.	Public Administration
11.	Community Services	27.	Health
		28.	Education
		29.	Welfare/Religion
		31.	University
12.	Entertainment/ Recreation	30.	Entertainment/ Recreation
	Household		Household

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