Assessing Contribution of the North East of England's University Sector to the Regional Economy.

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1. Introduction[1]

Universities make a significant contribution to the economic, social, cultural and educational life of their local regions. This paper seeks to quantify the economic impact upon the regional economy, in the 2003/04 academic year, of the six universities located within the North East of England. The study is timely, in that it is set in the context of changes in the characteristics of UK students, particularly rising proportions of students choosing to remain at parental home whilst studying; a decline in the generosity of the student funding system and unit of resource; and the significant rise in non EU student numbers. The analysis is performed using a 111 sector regional input-output model, including a set of worker occupation and qualification accounts. This work offers considerably more detail than previous UK studies which have tended to apply Keynesian multiplier methodologies, making ad hoc assumptions about the patterns of university expenditure and the magnitude of trade with other UK regions.

There is a long history of measuring the economic impact of universities and higher education institutions on their local economies, see CVCP (1994), Harris (1197) and Huggins (1997) and for reviews of some of the earlier studies in Great Britain. Only the more recent studies are reported here for comparison purposes. Harris (1997) examines the impact of Portsmouth for the 1994/95 academic year, he also review several studies from the mid 1980s to mid 1990s, these display a great variability in multiplier estimates, with multipliers ranging from 1.2 to 1.8, the author writes that 'in general, the results from the various studies mentioned are within a similar range and to

the estimates produced for Portsmouth, although the quality and accuracy of the underlying data sources used were often quite different' p620. CVCP (1994) and Huggins (1997) also report similar ranges of multiplier estimates. This range of the estimates, whilst being quite small in absolute terms, is large in percentage terms, and will arise from a combination of factors including, modelling based factors such as (1) underlying assumptions made by authors in areas such as student spending, relative sizes of local and non-local purchases, etc (2) data quality (3) the choice of I-O or multiplier methodology and (4) economy based factors such as the size of leakages from the area under consideration, which will be partly determined by the size of the local area under examination. Such economy based factors imply that a simple cross-study examination of multiplier estimates is not of much use in establishing confidence in estimate reliability, and that instead an examination of both the data quality and modelling methodology should be relied upon for establishing degrees on confidence in the various studies.

The relative advantages and disadvantages of the I-O methodology have received significant attention within the regional economics literature, see for example, West (1995), Roper (2004) and Armstrong and Taylor (2000), hence here only points relating directly to this paper are discussed. Whilst an I-O approach is significantly more expensive in terms of cost, data requirements and time inputs, than the more usually applied multiplier model, it is generally accepted that, if it is appropriately constructed it will yield more robust estimates than a multiplier study. Whilst the multiplier method may be capable of yielding *rough-and-ready* results it is unquestionably less compete than an appropriate I-O methodology. Although Scotland and Wales have their own I-O tables, as far as we are aware, there are only two English regions with up to date I-O tables (the South West and the North East). Given the ongoing improvement in data availability multi-sector

models, rather then Keynesian multiplier models, should now be the preferred choice for economic development and policy making at the regional level. This raises the questions as to what is the appropriate multi-sector model. Loverage (2004) points out that it is possible to 'observe model selection being driven by model availability … . In many cases models are to simplistic and do not adequately capture subtle relationships within the region's economy. In other cases, modelling systems are overly complex or make fine industrial disaggregations that may be difficult to defend.' p306. Harris (1997) notes in his review that, I-O studies produce the highest multipliers 'which probably reflects the methodology used' p620, this raises the possibility of a systematic bias being contained within the multiplier literature, arising due to the limited amount of economic detail that is incorporated within the modelling process (in addition to the possible bias in both methodologies from the fixed price assumption). Loverage does not consider multiplier models, but does consider the two sector *economic base model* and points out that one of the reasons the simpler model produces *higher* (not lower as suggested by Harris) multipliers is that economic base models 'tend to include government and capital in the non-basic sectors, whereas in I-O these are excluded from the multiplier process'. Our multiplier estimates are higher than those reported by other studies, this could be due to a variety of factors such as (1) lower leakages from the regional economy (2) changes in the composition of university sector spending from previous earlier studies, perhaps associated with the rise in UK, EU and overseas student spending as a ratio of university income.

The obvious strength of the I-O approach, over the multiplier approach, is that it produces results which can be disaggregated by industry/sector, the university sector to be compared to other sectors within the economy, backward and forward linkages can be examined etc. The I-O method also

allows the bolting on of some social accounting matrices, allowing distributional issues to be examined. The criticisms of the IO approach are frequently similar to those of the multiplier approach, that it assumes that supply passively responds to demand fluctuations (i.e Leontief production functions/right angle isoquants), there are no price fluctuations[2]. More realistic production functions are incorporated within an integrated I-O plus econometric model or a Computable General Equilibrium model. These models will generally produce lower multiplier estimates, as they allow for price effects, and would be more accurate when examining large changes to an economy[3]. It is unclear if these approaches will yield benefits over the I-O approach for marginal changes, given that (relative) price effects will be relatively small for marginal changes as compared to large shocks/interventions and that econometric/I-O and CGE models typically contain fewer sectors and hence less detailed results.

In order to calculate the impact of the Universities in the North East of England upon the local economy the, 'North East Regional Economic Accounts and Input-Output Model' has been used. This model has been produced by Durham Business School and was funded by the local development agency (One NorthEast). The model contains 111 industry/sector groups (with industries/products represented at either the 2 or 3 digit SIC 1992 level). To this core matrix, data relating to consumer spending of households, local and central government, capital investment, the

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[2] A speerate concern is that '[s]ome of the off-the-shelf I-O modelling systems also provide a false sense of security about the size of the disaggregated sectors.' Loverage (2004). Also see Hunt and Snell (1997)

[3] Note that for regional modelling many prices may not be determined locally, but in non-local product and resource markets.

external sectors (rest of UK and rest of the world – disaggregated by country or area), and wages and salaries are incorporated. Data includes variables such as number of business sites, number of employees, number of self-employed, gross output, total purchases, gross value-added, compensation of employment, capital spending, occupation & qualification mappings, exports by euro countries and non-euro continent, etc. The accounting framework and model links together the different aspects of the economy and allows for 'interactivity' between data (e.g. exports and employment together enable you to derive exports per employee). The model is only the second of its kind to be developed for English regions (the other is the South West, developed by Plymouth University Business School).

The version of the accounts and model used here is based upon the economic structure and technical relationships which existed during the year 2000. Given the results presented here are highly aggregated it is felt that any changes in technical relationships between the 2000 I-O accounts and the 2003/04 academic year are expected to be of a relatively small magnitude. The inflating of prices to 2004 levels is the only adjustment that has been made to raw results from the I-O model.

The mechanics of the Input-Output approach are well known and are thus not repeated here, see, for example, Richardson (1979) and Yan (1969).

2. Methodology

2.1. Overview

The North East region of England contains six universities, Durham University, the University of Newcastle upon Tyne, Northumbria University,

the Open University, the University of Sunderland and the University of Teesside. Table 1 shows the number of full- and part-time student enrolled at the 6 institutions, just over one hundred thousand students were enrolled in the institutions in 2003/04, this is in the context of a regional adult population of around two million.

Table 1: Student Enrolment 2003/04

	Total students	Total FE students	Total PG students	Total UG students
University of Durham	16185	0	4870	11310
The University of Newcastle-upon-Tyne	18335	0	5400	12935
The University of Northumbria at Newcastle	25605	535	5135	19935
The University of Sunderland	18720	875	2700	15145
The University of Teesside	21650	505	2355	18790
The Open University	2230	0	196	2034
Total	102725	1915	20656	80149

Source: HESA and OU internal estimates

The income levels of the institutions vary considerably (see Table 2). Northumbria, Sunderland and Teeside have broadly similar income profiles, with funding council grants, academic fees and 'other' as the main income sources. Durham and Newcastle received a much higher proportion of funds as research income than the other three institutions. In line with Government expectations, the expenditure of all institutions was slightly below income, to allow funds for future capital projects. The largest area of expenditure of was staff costs (50-60%), followed by other operating expenses (30-40%), depreciation and interest payable (and similar charges) were relatively small proportions of total expenditure.

The total impact of the sector upon the regional economy has been produced by carrying out four distinct modelling processes. These were to estimate;

1. the impact of university non-staff expenditure, (excluding identifiable capital expenditure);

2. the impact of university staff expenditure;

3. the impact of identifiable university capital expenditure;

4. the impact on non-local full-time student expenditure.

These are discussed in-turn below.

2.2. The impact of university non-staff expenditure, (excluding identifiable capital expenditure).

The expenditure profiles in Table 1 were disaggregated and mapped to the I-O model using a combination of data from institutional financial statements and the more detailed figures provided by the six institutions. The total non-staff expenditure for the universities amounted to £276.1 million. Where appropriate, this data was augmented using education data from the UK Supply and Use Tables. Relevant expenditure by the various student unions was aggregated into this area of the modelling process.

Table 2: Income by institution 2003-04

Institution	Durham	Newcastle	Northumbria	OU4	Sunderland	Teesside
Income £'000	153,788	249,660	139,545	n/a	90,584	80,668
Expenditure £'000	150,253	243,537	139,072	3,572	89,314	77,092
Surplus over income	3,535	6,123	473	n/a	1,270	3,576
Surplus %	2.3%	2.5%	0.3%	n/a	1.4%	4.4%

As with several previous studies, due to the nature of university accounting systems, (e.g. Armstrong 1993, Lincoln 1995), it was not possible to *accurately* extract expenditure made by the universities to run the student accommodation and catering services from other non-staff expenditure. It may have been preferable to identify this expenditure (e.g. to separate expenditure by on student catering from 'other' catering expenditure etc) and move the values into the student expenditure part of the analysis. This expenditure by universities is essentially a knock-on effect of expenditure by students, this includes student room lettings catering, fees and parts of student union spending. It has thus been necessary to include certain items that would be more accurately classified at student expenditure within this area of modelling. To avoid double counting these expenditures have subsequently been removed from estimates of student expenditure, using fee and accommodation revenue figures, etc provided by the institutions.

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[4] It was not possible to disaggregate regional income figures for the Open University as their accounts are produced on a national basis.

2.3. The impact of university staff expenditure.

Total staff numbers[5] and expenditure figures were disaggregated into the following occupational categories, using data provided by the institutions, academic, academic related, clerical, manual and domestic, research, technical and other. These were then mapped to the 11 types of household groups contained within the I-O model[6] using additional information from institutions (when available), and data contained within the Labour Force Survey. Each of these household types has a separate expenditure function, again disaggregated to the 111 sectors of the model. These expenditure vectors also include household savings, spending and income taxes, national insurance contributions and council taxes. Adjustments have been made allow for the leakage generated by staff in-commuting to the region, based around limited data provided by the institutions and the sub-regional estimates derived from the 2001 Census of Population produced by Townsend and Sutherland (2005). These estimates suggested that the extent of staff in-commuting was in the order of 2% for most of the institutions, a higher figure was used for Teeside university which is situated towards the south of the region and attracts a proportion of its staff from North Yorkshire.

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[5] The analysis of employees within this paper is in terms of full-time equivalent worker numbers. Where institutions provided headcount data conversions were made using hours of work estimates calculated by analysing LFS returns.

[6] Household groups were defined by the occupation of the head of household (the household reference person in the Labour Force Survey). Managerial, Professional, associate professional, clerical and secretarial, craft, personal services, sales, plant & machine, other, unemployed and retired.

2.4. The impact of identifiable university capital expenditure.

Where it was possible to identify university expenditure on capital projects the relevant expenditure has been removed from the non-staff expenditure totals and modelled separately. In most cases figures were provided on a project-by-project basis expenditure project, but this was not always possible. This allowed the accuracy of the analysis to be improved by ensuring that capital expenditure was allocated to appropriate sectors (construction, etc) rather than being treated as general university expenditure. The identifiable capital expenditure amounted to £31m.

2.5. The impact on non-local full-time student expenditure.

It is important to recognise that a large proportion of the sector's students are local, 44% of full-time undergraduate students and 22% of full-time postgraduate students were classified as local. It is unclear as to how to model these students, due to the difficulty in establishing a counterfactual. A proportion would have been studying locally and typically remaining in the parental home, for financial reasons and may be unable to afford to migrate to another region attend university (Barke et al 2000). Thus, if they were unable to gain a place at the university there is a strong possibility that they would remain within the region, and would have been contributing to regional expenditure. Other students may be choosing to remain within the region to study due to the quality of the regions universities. This problem of establishing a counterfactual for local students has lead to the removal of *all* of these students from the analysis. For the same reason, the spending of part-time students have been excluded from the analysis. Thus the study is focussing solely upon full-time students who have travelled to one of the

regions universities to study, as their expenditure arises as a direct result of the existence of the region's universities. Given that some of the 'local' students may have left the region to study were the sector not present in the economy, the figures reported below could be interpreted as minimum estimates (see Lincoln et al., 1995). Tables 3 and 4 show the compositions of full-time undergraduate and postgraduate students at the five institutions (all OU students were classified as part-time).

Table 3: Full-time Undergraduate Students 2003-04

	Total UG	UK and EU	Non EU
University of Durham	10950	10565	385
The University of Newcastle-upon-Tyne	12691	11790	901
The University of Northumbria at Newcastle	14645	13425	1220
The University of Sunderland	7779	6830	949
The University of Teesside	9243	8971	272
Total	55308	51581	3727

Source: Figures provided by institutions, may be inconsistent with HESA data.

Table 4: Full-time Postgraduate Students 2003-04

	Total PG	UK and EU	Non EU
University of Durham	2405	1085	1320
The University of Newcastle-upon-Tyne	3230	1675	1357
The University of Northumbria at Newcastle	2150	1014	986
The University of Sunderland	1855	1096	590
The University of Teesside	770	652	118
Total	10410	5522	4371

Source: Figures provided by institutions, may be inconsistent with HESA data.

Total expenditure estimates for each student were based around information contained within the *National Student Income and Expenditure Survey* (Calendar, 2004). This data was inflated to 2003/04 prices and augmented with various pieces of university level information for items of known items of student expenditure (for both UK and overseas students). These included tuition fees, university accommodation fees, etc.

As noted above to prevent double counting, student expenditure was reduced by an appropriate amount to account for spending items (accommodation fees, etc) included within university non-staff expenditure. An unavoidable consequence of this is that and student spending effects are lower than their true values. Leaving the figures in this form avoided making a series of arbitrary data manipulations, which would result in less robust *overall* final sector estimates.

Total annual expenditure of UK and EU students was assumed to be £7991 per annum and that of non-EU students £15991 (essentially to account for higher tuition fees). This gave a total figure for annual student expenditure of £340 million, prior to the removal of items included within the university accounts. Once these amounts had been removed the figure became £276 million.

This four modelling processes gave the figures for total spending/income as indicated in the first column of data in Table 5.

Table 5. Expenditure by area 2003/04

£000	Total expenditure	Total expenditure within the region	%
University non-staff expenditure	267095	121238	45%
University staff expenditure	3595577	1008038	28%
Identifiable university capital expenditure	31046	15935	51%
Non-local full-time student expenditure	276251	158500	57%
Total	933949	396476	42%

The expenditure of the four categories that occurs within the region is recorded within the second column of table two. As indicated above, to include within the modelling process the fact that households spend money, rather than individuals staff expenditure figures were mapped to households type and then to household spending functions. The remaining three areas of spending were mapped directly to I-O groups. For university non-staff spending occurring within the north east region this was done by starting with the structure of the education sector contained within the UK I-O tables. This vector was then augmented on an university-by-university basis with superior data available within published university accounts and bespoke data provided for this project. Once the non-staff expenditure was distributed to I-O groups a vector of industry regional purchase propensities

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[7] This is the expenditure of the HE institutions on staff, not the expenditure made by the household of employed staff.

[8] This is expenditure of university employees within the region (via their households).

was applied to the data (see the second data column in Table 2). A similar process was used to derive the identifiable capital expenditure figures.

Turning to the student expenditure figures, it was not possible to reliably estimate a complete student spending vector over the 111 sector I-O model. Instead the modelling strategy was to start with the vector already calculated for households with an unemployed worker as the head of household and to augment the vector with superior data on spending proportions calculated by Calender (2004) based upon a national student survey. Again, set of regional consumption propensities were then applied to this data.

3. Results

Many of the graphs below show and *initial* and *additional* impacts, of flows that occur within the North East Region due to the university sector. These are calculated using a product by industry Leontief model with compensation of employees and mixed income of the eleven household groups endogenised. Any purchases by the universities, staff and students that occur outside of the North East region have been removed and the model does not allow for feedback effects from spending occurring outside the region.

The *initial* impacts refer to the actual spending by the sector, this is the sum of university general purchases, university capital purchases, staff household and full-time non-local student expenditures (occurring within the North East region). This is similar to what many impact studies refer to as 'first round' effects, although care needs to be taken when making any comparisons, as we have included the direct effect of staff (and student spending) within this grouping, which is not always the case.

The *additional* impact, which is close to what are typically called 'indirect' effects, includes the following:

- o university suppliers making purchases from their own suppliers, who in-turn make their own purchases etc.
- o increased spending by households caused by increases in employment throughout supply chains.

The sum of these *initial* and *additional* effects is the impact of the region's university sector of the North East's economy, i.e. the Type II multiplier.

Some studies have produced estimates of only the output supported by university activity (Welsh Economy Research Unit 2003), whilst this may have been due to limited access to appropriate data, the results are difficult to interpret if no attempt is made to establish a link between output and either employment and/or gross value added (GVA). Most studies, using both multiplier and I-O methodologies have estimated both employment and output impacts (Armstrong 1993, Lincoln 1995, Chatterton 1997, Harris 1997 and Hill 1997). Although it should be noted that it is difficult to establish an accurate link between gross output and employment using a multiplier methodology, this is typically done by taking a regional output per average employee and scaling this to the multiplier estimates. As shown below, it likely that the impacts will be skewed towards the service sector indicating the use of a local economy wide average will lead to a bias in results As far as is known this is the first UK study to examine all three impacts, gross output, employment and GVA. As with the UK wide study by Kelly (2002), we also report disaggregated occupational figures, allowing the distributional effects of the sector to be considered.

3.1. Impact of gross output

The impact of the university sector upon the gross output of the North East economy was found to be £554 million, as valued at basic prices, this represented about 1% of the region's output, this is in addition to the output produced by the sector itself, see Table 6. Although it is not possible to put a value on the output produced by the universities, as their products are typically not sold at market prices, the usual practice is to value output as equal to the value of expenditure, (presumably an under estimate of the true market value of the services produced), thus in the North east of England university output will be at least £703 million. As expected, the largest output generated is in the private services sector, at roughly 60%. Just under one quarter of the effects were found in the sum of the manufacturing and construction sectors. Around one eighth of the impact was in the public services sector, these results are also summarised in Figure 1. The *initial* effect is roughly comparable in size to the *additional* effects and is much lower than the total sum of university and student expenditure due to the large leakages from the regional economy, the North East is the smallest of the English regions.

Figures given in Table 6 also indicates that when compared to the entire local economy the university sector supports a disproportionately high proportion of output in the service sector. This was due to two factors;

- The sectoral distribution of university purchases as compared to other industries, is skewed to the services sector.
- The influence of student spending. Other sectors with similar staff numbers will be associated with approximately similar regional household spending patterns. However, most sectors do not have the

influence of an additional increase in household spending, in this case caused by students, the obvious exception is the tourism sector.

Table 6: University Generated Gross Output (Basic Prices) 2003-04

(£million)	Initial	Additional	Total	Proportions for output supported by universities	Proportions in NE economy
Primary	1	3	4	1%	1%
Secondary	0	0	0	0%	1%
Manufacturing	44	27	71	13%	31%
Energy and water	11	16	27	5%	5%
Construction	34	19	53	10%	8%
Services (Private)	154	172	326	59%	35%
Public Services	34	38	72	13%	20%
All industries	278	276	554	100%	100%

Figure 1: Impact of universities on non-university output 2003-04
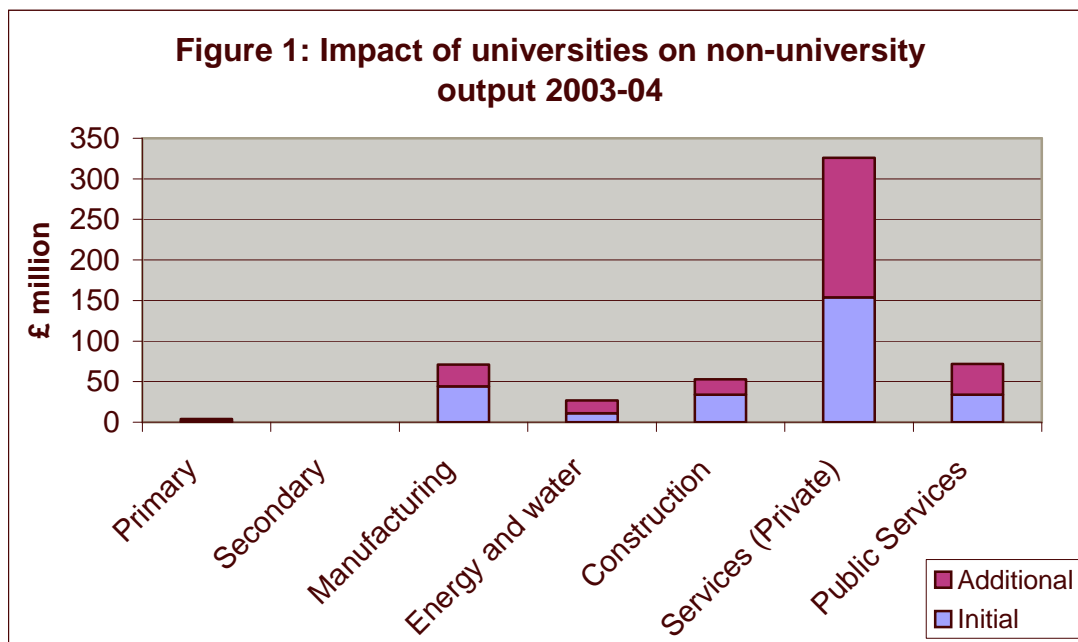
3.2. Impact on Gross Value Added (GVA)

The gross value added (GVA) generated in the rest of the NE by the university sector is equal to £300 million. This £300 million of GVA corresponds to 54% of the total output generated by the sector and approximately 1% of regional GVA. *As with the gross output figures, this estimate does not take into account any GVA produced by the universities themselves because university GVA figures are not produced and can not be approximated*.

Since the majority of output supported by the universities is in the service sector, the GVA supported also located primarily in the service sector, see Table 7 and Figure 2. GVA as a proportion of output is above the NE average within the service sector (62% as compared to 54% for the whole economy). This implies that 67% of supported GVA is located in the service sector compared to 59% of gross output. This difference in proportion highlights a problem for any cross area comparisons focussing solely upon output figures.

As with output the initial and additional GVA effects are of similar size, indicating that when measuring the impact of the universities on the region, the GVA supported as a direct result of the sectors spending in the economy is as important as the GVA generated by the actual spending of the sector, its staff and students.

Table 7: University generated GVA 2003-04

(£ million)	Initial	Additional	Total	Proportion of total generated GVA
Primary	1	1	2	1%
Secondary	0	0	0	0%
Manufacturing	16	9	25	8%
Energy and water	4	4	8	3%
Construction	12	7	19	6%
Services (Private)	97	104	201	67%
Public Services	21	21	42	14%
All industries	149	151	300	100%

Figure 2: Impact of universities on non-university GVA 2003-04
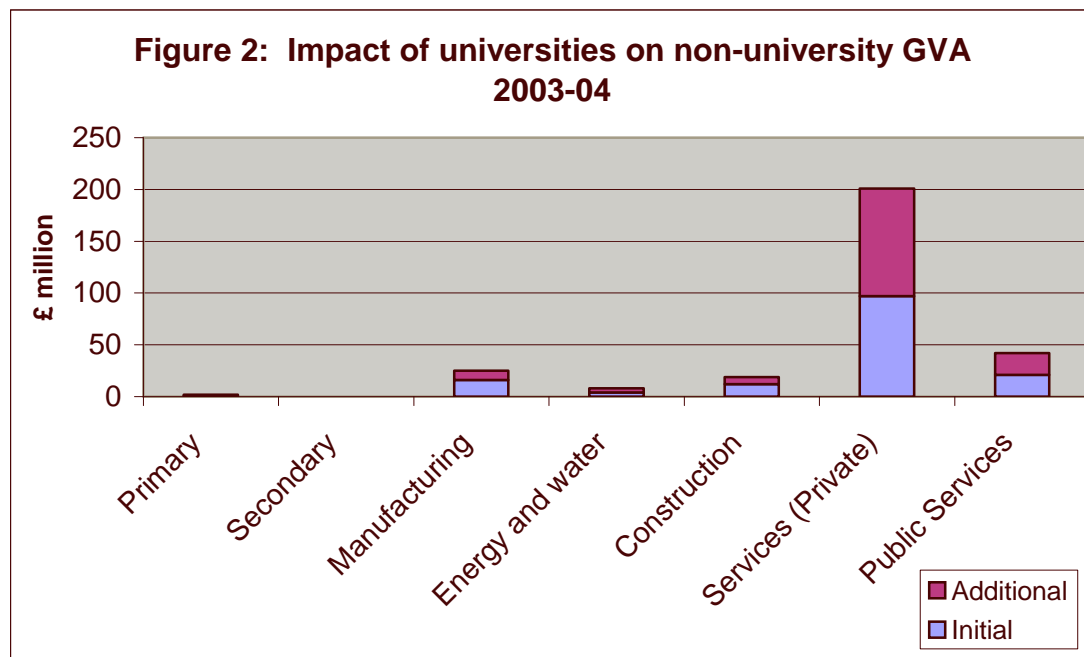
3.3. Impact on Full Time Equivalent (FTE) Workers

The spending of the universities, their staff and students support 11,450 full-time equivalent workers within the rest of the NE economy. This is in addition to the 11550 staff employed within the sector, generating a total

impact of 23,000 FTEs, see Table 8. The sum of university and supported employment represents around 2% of total regional employment.

Since full time equivalent workers is an area where the university sector has values which can be meaningfully included in the analysis, (this was not the case for gross output and GVA, see sections above) an employment multiplier can be calculated. This employment multiplier is equal to 1.99. Indicating that for each FTE job created, as a result of a proportional expansion in the university sector, another one job will be created elsewhere in the NE economy, creating a total impact of two FTE jobs.

Just over 60% of the supported FTEs were within the service sector, around 20% in public services and a similar proportion in the manufacturing and construction combined.

It in interesting to note, that while for the output and GVA impacts the initial and additional effects were of comparable size, this was not the case for the employment effects, where the initial effects were roughly 2.5 times the size of the additional effects, this is clearly illustrated in Figure 3. This reflects differences in employment to output ratios across sectors.

Table 8: University supported FTEs 2003-04

Sector	Initial	Additional	Total	Employees in HE sector	Grand Total
Primary	116	65	181		181
Secondary	1	5	6		6
Manufacturing	676	244	920		920
Energy and water	53	36	89		89
Construction	660	327	987		987
Services (Private)	5025	2033	7058		7058
Public Services	1668	541	2209	11550	13759
All industries	8200	3250	11450	11550	23000

Figure 3: Impact of universities on non-university FTEs 2003-04
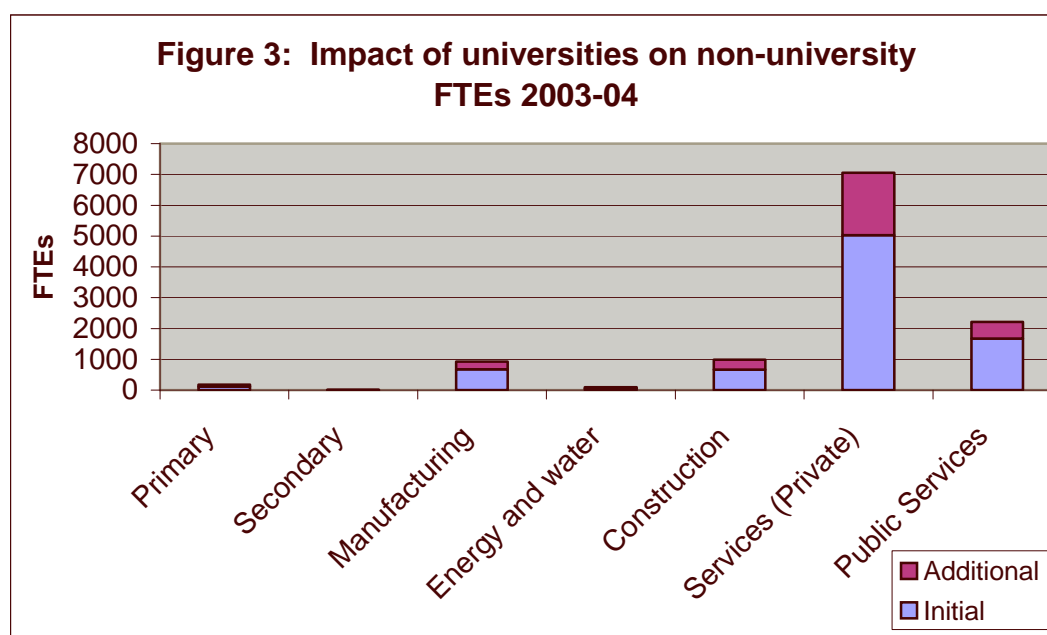
3.4. Impact on worker occupations

Occupations of the 11,550 FTE employees within the university sector are concentrated within the professional area (5,674 FTE employees) and clerical and secretarial areas (3,523 employees), see Table 9. Occupations generated elsewhere within the economy, see Table 10, by university related spending

are much more evenly distributed and are in similar proportions to NE economy as a whole, see Table 8. The exception is a disproportionately high number within sales and related occupations (14% as compared to 8% in the economy as a whole). This reflects the additional effect of students' spending.

If the occupations of jobs within the sector and those supported elsewhere within the economy are examined together, there are above-average FTEs in the professional and clerical/secretarial areas and below-average proportions in all other occupations as compared to the total NE economy.

Table 9: University Supported FTEs by Occupation 2003-04

Occupation	Initial	Additional	Total supported FTEs	FTEs in university sector	Grand total
Managers and Senior Administrators	1554	566	2120	443	2563
Professionals	525	245	770	5675	6445
Associate professional and technical	498	227	725	639	1364
Clerical and secretarial	791	396	1187	3523	4710
Craft and related	947	384	1331	-	1331
Personal and protective	1122	396	1518	989	2507
Sales	1227	384	1611	-	1611
Plant and machine	678	308	986	282	1268
Other	857	345	1202	-	1202
All occupations	8119	3331	11450	11550	23000

**Table 10: University and supported FTEs occupations (%) 2003-04**

| Occupations	Proportions of occupations in university sector	Proportions of occupations generated by university sector	University and supported	Proportions of jobs in NE economy
Managers and Senior Administrators	4%	19%	11%	15%
Professionals	49%	7%	28%	11%
Associate professional and technical	6%	6%	6%	10%
Clerical and secretarial	30%	10%	20%	13%
Craft and related	0%	12%	6%	12%
Personal and protective	9%	13%	11%	12%
Sales	0%	14%	7%	8%
Plant and machine	2%	9%	6%	11%
Other	0%	10%	5%	8%
All occupations	100%	100%	100%	100%

3.5. Impacts by origin of spending

Of the entire impact of the sector on non-university output, GVA and FTEs approximately 33% relates to university spending[9], 28% to university staff spending and the remaining 38% to non-local student spending, see Figures 10 and 11. Hence around 62% of the impacts are due to flows originating from the universities themselves (staff plus non-staff costs) and the remaining 38% is due to the regions ability to attract non-local students to the area.

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[9] Note that university spending includes student spending on hall of residences etc.

Figure 4: Impact of universities by origin of spending 2003-04
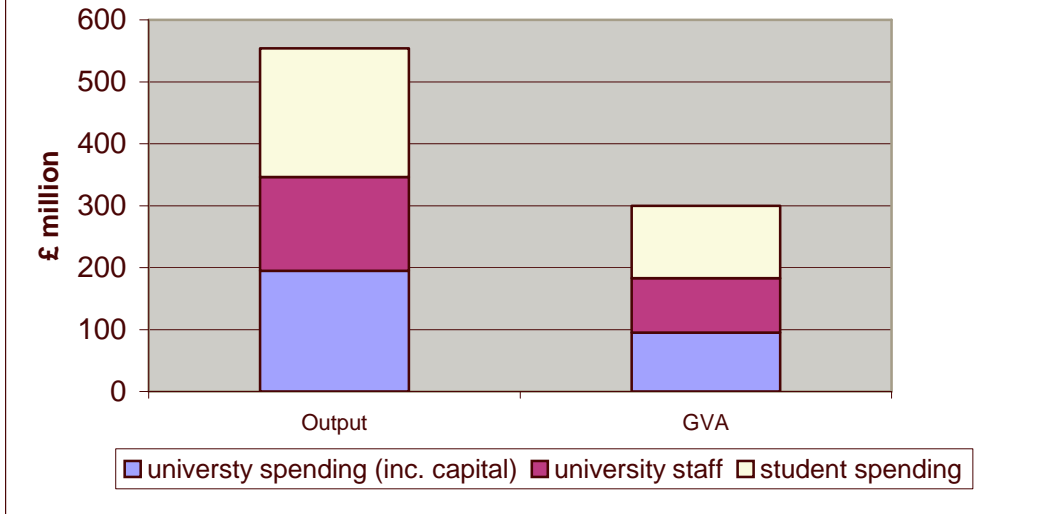
Figure 5: Impact of universities by origin of spending 2003-04
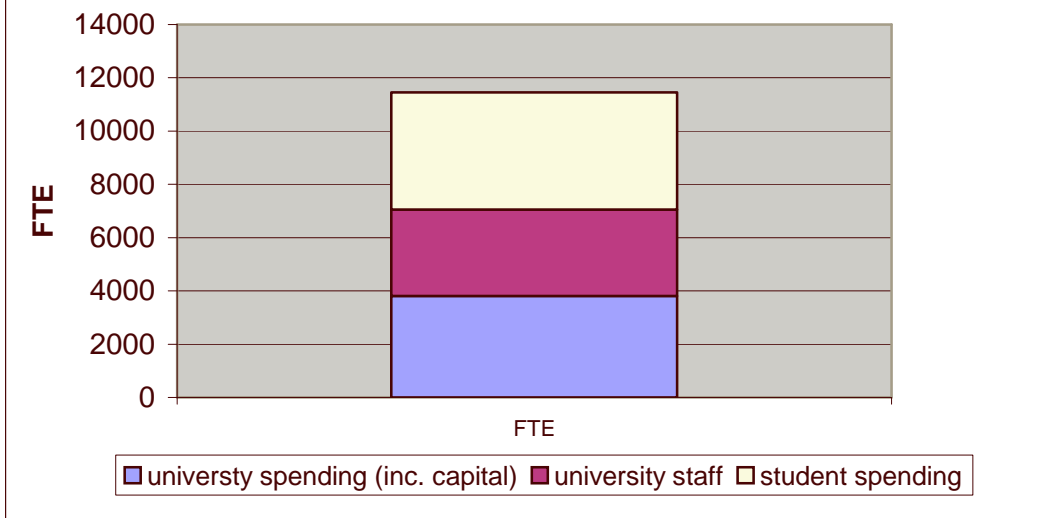
4. Conclusion

This paper quantifies the economic contribution made by the North East's six

universities (Durham, Newcastle, Northumbria, the Open University,

Sunderland and Teesside) to the regional economy. The university sector represents a significant component of the region's economic activity. Total expenditure of the six institutions and their students together, amounted in 2003-04 to £975 million (including staff wages and salaries). Of this amount some £577 million was actually spent within the North East region.

This injection into the economy gave rise to additional rounds expenditure, as for example, companies supplying universities make their own purchases, take on extra workers etc. This is estimated to have generated an extra £554 million of output within the region, on top of the initial £577 million. This total of £1.1 billion represents approximately two percent of the total regional economic activity.

In terms of employment, the universities directly employed 11,450 full time equivalent employees in 2003-04. The spending of universities themselves, and of their staff and non-local students gave rise to an additional 11,550 full-time equivalent jobs within the local economy, which represents roughly two percent of total regional employment. The distribution of the occupations supported by the sector contains around 10% more professional, associate professional and managerial jobs than the proportion contained within the whole North East economy.

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