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"POLICY SCEPTICISM" AND THE IMPACT OF LONDON-BASED HIGHER EDUCATION INSTITUTIONS (HEIs) ON THE ECONOMY OF ENGLAND: ACCOUNTING FOR ALTERNATIVE USES OF PUBLIC EXPENDITURE

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"Policy Scepticism" and the Impact of London-based Higher Education Institutions (HEIs) on the economy of England: Accounting for Alternative Uses of Public Expenditure

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Abstract

This paper replicates the analysis of Scottish HEIs in Hermannsson *et al* (2010a) for the case of London-based HEIs' impact on the English economy in order to provide a self-contained analysis that is readily accessible by those whose primary concern is with the regional impacts of London HEIs. A "policy scepticism" has emerged that challenges the results of conventional regional HEI impact analyses. This denial of the importance of the expenditure impacts of HEIs appears to be based on a belief in either a binding regional resource constraint or a regional public sector budget constraint. In this paper we provide a systematic critique of this policy scepticism. However, while rejecting the extreme form of policy scepticism, we argue that it is crucial to recognise the importance of alternative uses of public expenditure, and show how conventional impact analyses can be augmented to accommodate this. While our results suggest that conventional impact studies overestimate the expenditure impacts of HEIs, they also demonstrate that the policy scepticism that treats these expenditure effects as irrelevant neglects some key aspects of HEIs, in particular their export intensity.

Keywords: London Higher Education Institutions, Input-Output, England, Impact study, Multipliers.
JEL classifications: R51, R15, H75, I23 .

1. Introduction

This paper replicates the analysis of Hermannsson *et al* (2010a) for the impacts of London-based HEIs on the economy of England. The main differences from our analysis of Scottish HEIs' impacts are, of course, in the tables, graphs and discussion of results. The rationale for this approach is to provide a convenient, readily accessible, self-contained analysis of the expenditure impacts of HEIs in London for user groups whose primary interest is in impacts on the English economy. Since we are producing similar analyses for other regions, this is also an efficient way for us to generate a range of the regional-specific outputs of our research project on *The Overall Regional Impacts of HEIs* quickly.[1] Subsequent contributions will provide a fuller comparative regional analysis of HEI impacts.

There have been numerous studies of the impact of higher education institutions (HEIs) on their host regional economies, which focus solely on their effect on the local demand for goods and services. (See e.g. Florax, 1992 and McGregor *et al*, 2006, for reviews.) These demand side studies treat universities like any other businesses, which demand goods and factor services within the region[2]. The best of these studies employ regional input-output analysis. However, a "policy scepticism" has emerged that challenges the value of such analyses. This scepticism asserts that either demand-side binding budget constraints or supply-side binding resource constraints generate "crowding out" of HEI expenditure effects on the host regional economy, to the point where the regional impact of HEIs expenditures is regarded as negligible. In this paper we provide a systematic critique of this perspective. While we reject the extreme form of policy scepticism we acknowledge the importance of the public sector expenditure constraints when these are imposed on the devolved administrations of the UK through the Barnett formula.

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[1] The full details of the project are provided in the acknowledgements.
[2] HEIs may also have important impacts on the supply-side of regional economies through, for example, their impact on skills in the host region's labour market, knowledge effects and wider external benefits. These are discussed in Hermannsson *et al* (2010b).

However, the study of HEIs in England provides an example of a region that is not subject to a binding public sector expenditure constraint. Nonetheless, our view is that it is still instructive to explore the impact of alternative uses of the public funds used to support London HEIs. Accordingly, here we apply the same principles to London HEIs and their impact on the economy of England, a UK "region" with a large higher education sector.

The analysis of HEI impacts is based upon an augmented Input-Output (IO) analysis for England in which the higher education sector is separately identified[3]. Impact results are derived using standard IO assumptions. However, we also consider how the standard IO assumptions, and current practice, have to be modified in an attempt to reflect the opportunity cost of the public funding of London HEIs. We implement a novel treatment of student expenditure where, in line with standard IO assumptions, we seek to identify the degree to which student's consumption expenditures can be treated as exogenous. Two quite different treatments of student expenditures are apparent in the literature, focussing either on the expenditures of all students in the host region (Harris, 1996) or only those who move into the region to study (Kelly *et al*, 2004). We argue that both are approximations to an appropriate distinction between those parts of student expenditures that can legitimately be regarded as exogenous, and those that should be treated as endogenous. The details of this procedure are outlined in an Appendix.

The remainder of the paper is structured as follows. In Section 2 we outline the approach adopted by conventional (input-output-based) regional HEI impact studies, and summarise the results that the implementation of this approach yields when applied to our purpose-built, HEI-disaggregated, input-output database for England. We explore the basis of the "policy scepticism" in Section 3, attributing this to two broad possible sources: an acknowledgement of a resource constraint on the supply-side and a public sector budget constraint on the demand-

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[3] For details of the construction of the Input-Output table, the derivation of the income and expenditure structure of the HEIs sector and the data sources used see Hermannsson *et al* (2010c).

side. We argue that the traditional "Green Book perspective" of complete supply-side crowding out of regional expenditures is not directly applicable to the context of a single region. Indeed, at the regional level the passive supply-side assumptions required to motivate the use of input-output analysis may apply in the longer term, though our view is that this is much more likely for the peripheral economies of the UK than it is for England. However, we also argue that it is instructive to consider alternative uses of any public funding of institutions that are the subject of regional impact studies. In particular, in the context of incremental increases (or decreases) in public expenditure on HEIs, the application of conventional impact analysis effectively assumes that these expenditures are externally-financed (through the central government). If, instead, they are financed by switching/ reallocation of the government expenditure within England, then the impact of this should be explicitly identified. We show how this can be accommodated within conventional impact analyses. Inevitably, our results suggest that the aggregate impact on the host region of such switching is significantly less than conventional impact analyses imply, though in the London case the net impact remains significant and positive.

In Section 4 we show that it would be wrong to infer from the small net "balanced expenditure multiplier", which (we establish in Section 3) applies to general government expenditure in England being switched to HEIs, that HEIs have a negligible overall impact on their host region that is additional to the impact of public expenditure *per se*. We illustrate this through an IO-based attribution analysis, which highlights the fact that HEIs are emphatically not part of the public sector, with 43% of London HEIs' funds coming from public sources (significantly less than for Wales, 58% and Scotland, 54%), but are in fact export-intensive. We show that of the "total impact" of HEIs on English output that would be attributed to HEIs in a conventional analysis, only some 48% are in fact attributable to public funding *per se*.

Section 5 presents brief conclusions. Overall, our results suggest that conventional impact studies do overestimate the impact of HEIs' expenditures on their host region. However, our findings also demonstrate that the policy scepticism that treats the expenditure effects of HEIs as irrelevant neglects some important characteristics of these institutions, notably their export intensity. Although this analysis is illustrated in terms of the impact of London HEIs, it is, at least in principle, relevant to any impact analysis where there is interest in the opportunity cost of public funding.

2. Conventional regional impact analyses

Conventional impact analyses of HEIs on their host regions identify the total effects of HEIs as the sum of the impact of institutional expenditures and of (typically part of) the expenditures of their students. We begin with a brief account of regional input-output-based impact analyses. We then consider the application of this approach to institutional and then to student expenditures

2.1 Theoretical basis of conventional regional impact analyses

Regional impact analyses are frequently employed to capture the total spending effects of institutions, projects or events. In addition to simply identifying the direct spending injection of the studied phenomenon, multiplier, or "knock-on", impacts are estimated by summing up subsequent internal feedbacks within the economy (see Loveridge (2004) for a review). This section briefly outlines the methods adopted by impact studies[4]. Based on the typical assumptions made in the literature the regional demand-side impacts of the HE sector on the English economy is derived for 2006.

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[4] For a more detailed account of the methodology of impact studies and regional multipliers see e.g.: Miller & Blair (2009), Armstrong & Taylor (2000).

Most regional demand-driven models (e.g. Export base, Keynesian multiplier, Input-Output) view the economy in terms of two parts, exogenous and endogenous. Exogenous variables in these models are taken to be independent of the level of activity of the relevant economy; endogenous variables are primarily driven by the overall level of income or activity within the economy. Specifically demand for intermediate inputs and often consumption demand are taken to be endogenous. Other elements of final demand (exports, government expenditure, investment) are taken to be exogenous[5]. There is then a clear causal pathway from exogenous to endogenous expenditure.

In addition, interpreting the results of these demand driven models rests on the assumption that the supply-side of the economy operates in a passive way. At the regional level, conventional multiplier analyses can be validated by either of two sets of conditions. In the short and medium runs this would be where there is general excess capacity and regional unemployment. In the long-run, it is where factor supplies effectively become infinitely elastic, as migration and capital accumulation ultimately eliminate any short-run capacity constraints (McGregor *et al,* 1996)[6].

The derivation of the multipliers draws on the notion of exogenous expenditure driving endogenous activity. In the standard Leontief Input-Output approach total activity within the economy can be described in terms of an equation where the total output of each industry equals final demand, which is exogenous, times multipliers as represented by the Leontief inverse. This can be summarised as:

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[5] The distinction between endogenous and exogenous activity depends on the model and the application. In particular, what is exogenous and what is endogenous to the model does not have to correspond with what is 'inside' and what is 'outside' the region in spatial terms.

[6] The nature of the regional economy naturally governs the realism of such an assumption. One limiting case is the example of the island economy of Jersey where the institutional framework restricts migration so that crowding out can be expected even in the long run. See Learmonth *et al* (2007).

$$q = (1 - A)^{-1}f \qquad\qquad \textbf{Equation 1}$$

where q is a vector of gross outputs, f is a vector of final demands and $(1-A)^{-1}$ is the Leontief inverse. The output multiplier for each sector is the change in total output for the economy as a whole resulting from a unit change in the final demand for that sector. It can be found as the sum of columns of the Leontief inverse. This allows a convenient expression for the gross output q_i attributable to the final demands f_i for the output of sector i:

$$q_i = l_i f_i \qquad\qquad \textbf{Equation 2}$$

Where l_i is the output multiplier for sector i.

Multipliers can be derived to relate a variety of activity outcomes, such as employment, income, output or GDP, to exogenous changes in demand. Although a number of variants can be applied the Type-I and Type-II demand-driven multipliers used here are typical for Input-Output based impact studies. Type-I multipliers incorporate the increase in demand for intermediate inputs, and treat household consumption as exogenous. Type-II multipliers also include induced consumption effects as endogenous For further details see: Hermannsson *et al* (2010c), Miller & Blair (2009, Ch. 6).

This study draws on an augmented English Input Output table (Hermannsson *et al* (2010c). Income and expenditure data for London HEIs are used to identify a separate HEI sector. That is to say the existing education sector is split into two elements, HEI and non-HEI education. We then further disaggregate HEIs into those based in London and those based elsewhere in England. This disaggregation reveals the income and expenditure structure of London HEIs and makes it possible to derive appropriate multipliers. The table, and associated model, treat the

HE sector on the same basis as any other sector: as a demander of goods and services and factor inputs, and as a supplier of services to meet intermediate and final demand. Applying these principles to derive the demand-side impacts of HEIs entails estimating the economic activity contingent upon the economy's final demand for the HEIs' services and the implicitly linked exogenous expenditure of their students.

2.2 The regional impact of HEIs' own expenditures

An extensive literature estimates the impact of HEI spending on their host regional economies solely through these demand side (expenditure-related) effects. For example Florax (1992) identified over 40 studies of the regional economic impact of HEI expenditure and much has been published since. Table 1 below presents a summary of the major Scottish HEI impacts studies. Most, especially the earlier analyses, are based on Keynesian income-expenditure models e.g. Brownrigg (1973), Bleaney *et al* (1992), Armstrong (1993) and Battu *et al* (1998), whilst a smaller number use some variant of IO modelling e.g. Blake and McDowell (1967), Kelly *et al* (2004) and most recently Hermannsson *et al* (2010a)[7]. These studies differ in the type of multiplier they report, the approach used to derive the multiplier values and the geographical definitions of the studies. Unsurprisingly therefore, the multiplier values generated differ somewhat and are in most cases not directly comparable[8]. McGregor *et al* (2006) summarise the methods and findings of the main UK studies and Harris (1997) provides an application to a sub-region of England.

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[7] McGregor et al (2006) argue that, although less frequently applied, the IO analysis is methodologically superior to Keynesian income-expenditure models. However the latter might be used in circumstances where indicative results are considered sufficient or IO accounts are not available and cannot be constructed with the resources available.

[8] Except perhaps in the most recent studies based on the Scottish Input-Output tables.

Table 1 Overview of main Scottish HEI impact studies[9]

Subject of study	Multiplier value	Geographic boundary	Source of multiplier value
St. Andrews University (Blake & McDowall, 1967)	1.45 (Household income)	St. Andrews (pop. 10,000)	Input Output table
Stirling University (Brownrigg, 1973)	1.24 - 1.54 (Income)	Parts of Sterling and Perth (pop. 96,000)	Brown et al (1967), Greig (1971)
Strathlcyde, Stirling and St. Andrews Universities (Love & McNicholl, 1988)	1.34, 1.43, 1.36 (student spending)	Scotland	Brownrigg & Greig (1975), McNicholl (1981)
Aberdeen, Dundee and Stirling Universities (Love & McNicoll, 1990)	2.18 (output), 1.75 (GDP), 1.95 (employment)	Scotland	Scottish Input Output Tables (1979)
Aberdeen University (Battu et al, 1998)	1.46 (spending), 1.61 (employment)	North East of Scotland	Greig (1971), Brownrigg (1971), McGuire (1983), Harris et al (1987)
Strathclyde University (Kelly et al, 2004)	1.63 (output), 1.38 (employment)	Scotland	Input Output table
Strathclyde University (McNicholl, 1993)	2.15 (output), 1.66 (Income)	Scotland	Scottish Input Output Tables (1989), Survey
Scottish HEIs (1) 1995	1.76 (output), 1.7 (employment)	Scotland	Scottish Input Output Tables (Hybrid, 1994-5)
Scottish HEIs (2) 1999	1.73 (output), 1.42 (employment)	Scotland	Scottish Input Output Tables (SLMI, 1997)
Scottish HEIs (3) 2004	1.6 (output), 1.4 (employment)	Scotland	Scottish Input Output Tables (2000)
HEI impacts projects 2009	1.3 (output type I), 2.1 (output type II)	Scotland	Scottish Input Output Table (2004)

A variety of multipliers can be derived to link a particular exogenous change to changes in a number of economic outcome metrics. The output multipliers relate changes in final demand to the change in gross output. Therefore, an output multiplier of 2.15 as found in McNicoll (1993) implies that a unit increase in the final demand for the outputs of Strathclyde University leads to a Scotland-wide change in output of 2.15. The stated employment multipliers show the economy-wide change in employment caused by a unit increase in direct employment. The household income multiplier used by Blake and McDowell (1967) is slightly unusual, but appropriate for their small borough application, where they relate changes in the total output of the University of St. Andrews to changes in local household income. The income multipliers used by Brownrigg (1973) relate exogenous changes in regional income to the overall change in regional income[10].

When we apply conventional input-output analysis to our HEI-disaggregated Input-Output table for England, we find that in 2006 the Type-I output multiplier for the London HEI sector is 1.40 (compared to 1.33 for Scotland and 1.29 for Wales and 1.29 for Northern Ireland) and the Type-II multiplier is 3.07 (2.12 for Scotland, 2.09 for Wales, 2.29 for Northern Ireland). That is, each

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[9] The multipliers presented are in most cases not directly comparable among studies as their exact definition varies. Furthermore, they differ in terms of what spending is treated as exogenous.
[10] Where regional income is equivalent to GDP as derived by the expenditure method. For further details on Keynesian multiplier models see Chapter 1 in Armstrong & Taylor (2000).

£1 of final demand for the output of London-based HEIs should generate an England-wide output amounting to £1.40 if indirect knock-on effects are included and £3.07 if induced impacts are included too. As is summarised below, based on these assumptions the HEI sector in London drives a significant amount of economic activity within England: approximately 0.47% of total output (compared to 1.83% for Wales) and 0.55% of overall employment (2.09%). Of course, this is not a like-for-like comparison since we are focussing only the London-based HEIs within England.

Table 2 Summary of expenditure impacts of HEIs, based on traditional IO-assumptions, £m and FTE's

	Final demand		indirect and induced impacts		Total impact	
Output, £m	3,459	0.15%	7,176	0.31%	10,635	0.47%
Employment, FTE's	46,208	0.26%	51,947	0.29%	98,155	0.55%

2.3 The treatment of students' consumption expenditures

In addition to the impact of the institutions' own expenditures we also account for the implicitly linked (exogenous) students' consumption expenditure that occurs within the local economy. In practice this involves: determining the level of student spending; judging the extent to which this is additional to the English economy, and identifying how student expenditures are distributed among sectors. Perhaps the most difficult part of this process is the disaggregation of students' consumption expenditures into its exogenous and endogenous components.

There have been two alternative treatments of student expenditures in past impact studies: one incorporates only the expenditures of in-coming students (e.g. Kelly *et al*, 2004), the other includes all student expenditures, irrespective of their origin (e.g. Harris, 1997). Here we argue that each of these past treatments of student expenditure impacts represents an approximation

to an input-output accounting approach in which the crucial distinction is that between the exogenous and endogenous components of student expenditures. While it is true that the whole of external students' expenditures can be regarded as exogenous to the host region, home students' expenditures cannot legitimately be treated as either wholly endogenous, which is what would be required to validate the first approach, nor wholly exogenous, which would be required to validate the second.

The case of students from outside of England is straightforward: their expenditures are unambiguously exogenous, as their incomes are derived from an external location. The treatment of their expenditure is similar to that of tourists. For local students, the distinction between their endogenous and exogenous consumption is less clear cut. To a large extent their income, and hence consumption, is endogenous to the local economy in that it comes from wages earned from local industries and transfers from within local households. For local students simplifying assumptions are adopted in line with the typical IO notion of exogeneity. The exogenous components of local students' consumption expenditures are assumed to be expenditures financed from commercial credit taken out during their years of study, student loans, education-related grants and bursaries and social security benefits. When estimating the balanced expenditure impact of student's consumption expenditure we identify grants and bursaries provided for by funding from general government expenditure.

For details of English students' income and expenditures this study draws on a study by Johnson *et al* (2009a). The full details of how student expenditures are determined are reported in the Appendix. This reveals that *per student* the net contribution to final demand is greater for incoming students than local ones as there are smaller deductions of incomes that should be treated as endogenous.

**Table 3 Derivation of per student spending broken down by place of domicile**

Location of domicile		England	Rest of the UK	Rest of the World
Gross average student spending £	+	12,254	13,663	13,663
Income from employment £	-	2,108	2,108	
Within household transfers £	-	2,045		
Other income £	-	219		
Dissaving £	-	1,828		
Tuition fee expenses	-	2,251	2,251	2,251
Spending attributable to new commercial credit £	+	379		
Exogenous average per student spending	=	**4,182**	**9,304**	**11,412**
Direct imports £ (13.4%)	-	559	1,243	1,524
Net change in final demand per student £	=	**3,623**	**8,061**	**9,888**
Number of students FTE's	x	217,245	4,317	68,582
Estimated net contribution to final demand by student population £ m	=	**787.1**	**34.8**	**678.1**

Once students' net contribution to final demand has been determined the next step is to estimate the knock on impacts of their consumption spending. A student expenditure vector estimated by Kelly *et al* (2004) is used to derive the spending impact of the different student groups in England. The output multiplier for student spending derived from the IO tables is 2.62. Hence, a direct injection of £1,500 million (sum of the bottom row in Table 3), drives £3,923 million of output in the English economy, as is summarised in Figure 1 below. As the preceding discussion indicates the consumption multiplier cannot be applied directly to students' gross term-time spending as reported in income and expenditure surveys. Gross expenditures have to be adjusted for spending financed by income sources endogenous to the English economy. When these adjustments are applied to multipliers we find that for each £1 of local students' gross term time expenditures the England-wide economic impact is only 77 pence. This is because these expenditures represent, to a significant extent, a redistribution of spending within the English economy and so only partially constitute an additional injection. The impact of per unit gross spending of incoming students is stronger as more of it represents an additional injection into the regional economy.

Despite the relatively modest per student impact, English students make up 75% of the student population and drive approximately 53% of the total student consumption impact. Students

from the rest of the World are responsible for approximately 45% of the total consumption impact. The remaining 2% is made up by the expenditure of students from the rest of the UK.

Figure 1 Output impact of student spending in England disaggregated by student origin, £m
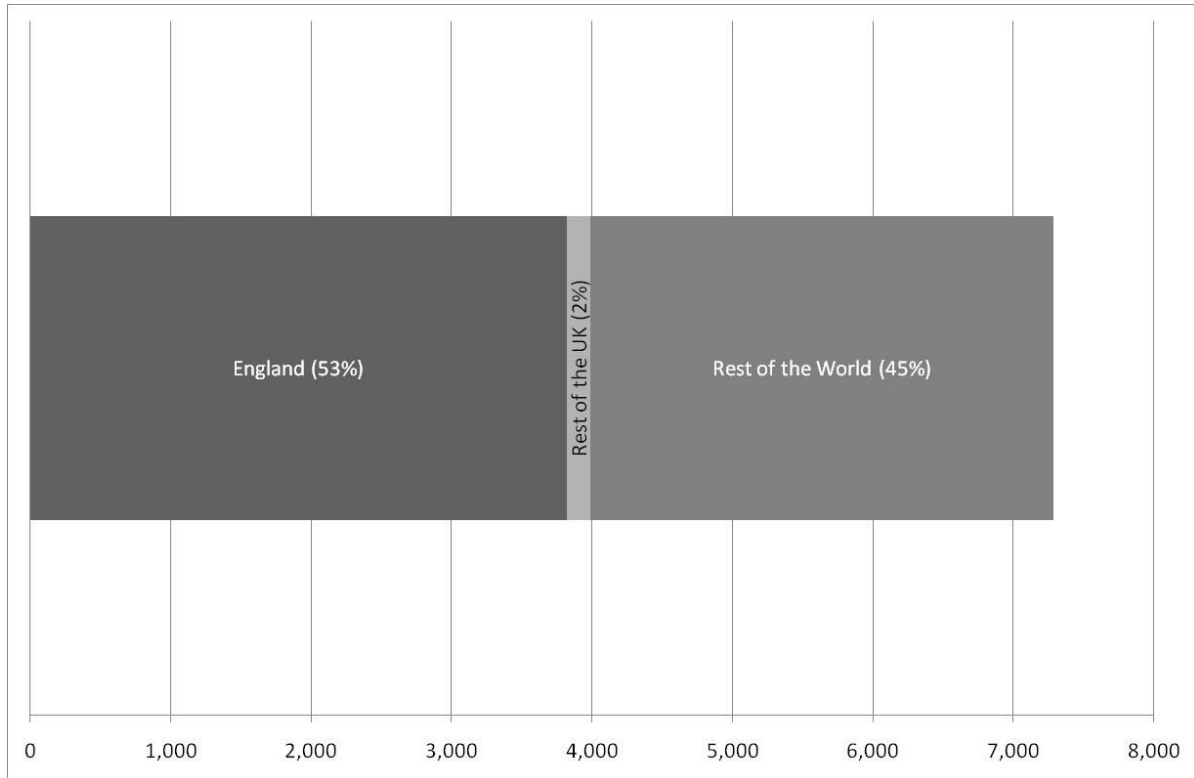
Students' consumption impact is a significant complement to institutional expenditures when measured in terms of total English output. Whereas institutional expenditures support 0.47% of overall output in the economy an additional 0.17% is provided for by students' consumption. In output terms these represent 27% of the total impact of HEIs. The employment impact of students' consumption is slightly more subdued, however. Whereas HEIs support 0.61% of overall employment, student's consumption expenditures provide an additional impact of 0.15%, or approximately 20% of the overall employment supported by the London HEIs and their related expenditures within England.

This section has summarised typical practice for estimating the regional expenditure impact of HEIs and their associated student population. The next section examines criticisms of this approach and considers appropriate responses to these.

3. Policy scepticism and the impact of HEIs

There appear to be two main ways of motivating an assumption of complete "crowding out" of HEIs expenditures within their host region: a tight resource constraint; a binding regional public sector budget constraint. We consider each in turn.

3.1 Resource Constraint

One potentially important source of scepticism within the UK about regional demand-driven impact multipliers is the 100% crowding-out argument that characterised the HM Treasury Green Book's analysis of regional impacts. Here a pure demand disturbance that stimulates employment in one region has an equal and offsetting impact on employment in other regions of the UK, given that the UK economy is taken typically to operate at "full employment" (or the natural rate of unemployment or NAIRU). However, even if there exists a 100% crowding out at the level of the UK as a whole, this would not apply at the level of the host regional economy[11]. It is quite legitimate for Scottish and Welsh governments, for example, to be concerned about the demand-side impact of particular institutions/expenditures for their own economies. While there is no devolved government in England, it is equally clear that aggregate English-region employment multipliers are not constrained to be zero by the presence of a UK NAIRU.

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[11] Though it could under limiting conditions of a completely inelastic labour supply curve or infinitely elastic labour demand curve, but these are extreme and empirically unlikely parameter values (McGregor and Swales, 2005).

Of course, none of this implies that the supply side is unimportant. Rather it simply emphasises that the demand side cannot be dismissed as irrelevant at the level of the individual region. There undoubtedly is, and certainly ought to be, policy interest in the demand side impact of public expenditure decisions in a regional context. Furthermore, the issue of supply- side crowding out must depend on supply-side conditions in national and regional economies and on institutional arrangements: there certainly is no "law" of 100% supply-side crowding out of regional demand changes. However, it seems likely that resource constraints are more likely in London and in the economy of England, and that these will not be completely alleviated through factor mobility even in the long-run, as may be the case for peripheral economies (McGregor *et al*, 1996). However, while this can be handled in our HEI-disaggregated computable general equilibrium framework, here we continue to focus simply on the *potential* demand effects of London HEIs in this paper (at unchanged prices and wages). These are the maximum expenditure impacts conditional upon an assumed passive supply side. For the remainder of this paper we therefore concentrate on the other possible motivation for policy scepticism: a binding regional public sector budget constraint.

3.2 Alternative uses of public funding of HEIs

In the context of the peripheral regional economies of the UK, the idea here is that an increase in public expenditure on HEIs will induce offsetting changes in demand through the operation of a binding regional public sector expenditure constraint. In the Scottish, Welsh and Northern Irish contexts, this operates through the Barnett formula, which determines the allocation of devolved Government funding from the central government in Westminster[12]. In the case of England there is no comparably binding regional public sector expenditure constraint. However, even in these circumstances it is interesting to explore the opportunity cost of public funding of London HEIs by asking what the consequences would be of using the funds for an alternative

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[12] For further details see e.g. Ferguson *et al* (2003, 2007).

use, such as expanding the public sector in England. The conventional regional multiplier analysis, which we presented in Section 2 above, implicitly assumes that the financing of the HEI expenditures in London comes from a supra-regional source - the Westminster Government – with no ramifications for other elements of government expenditure in England.

Does taking account of the opportunity cost of public funding of London HEIs, by treating them "as if" they are subject to an English public expenditure constraint imply that host-region employment multipliers are zero? To address this question it is helpful to begin by focussing simply on changes in the public funding of HEIs in England, and note that increased public spending on HEIs may possibly have to be financed by contractions in other government expenditures within England. Therefore, if more funds are allocated to HEIs, less funds may be available for other public expenditures.

To illustrate the significance of the difference between the cases we conduct two simulations of the introduction of a hypothetical additional £100m of expenditure on HEIs in England. In the first case we adopt the traditional impact study assumption that the exogenous increase in expenditure is entirely externally funded, for example from UK-level funding or foreign students' fees, and does not have any ramifications for other public spending in England. The second case examines how the impacts change when there is a corresponding reduction of other public spending in England. In the latter case the offsetting £100m reduction in public spending is applied to an aggregation of those sectors that receive 97%[13] of central and local government final demand in the English IO tables.

The Type-II multiplier for the HEI sector in England is 3.07. Without any offsetting cutbacks in public spending the additional spending on HEIs has an output impact of £307 million.

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[13] The public sector is aggregated from 4 sectors in the HEI-disaggregated IO table (IO69, IO70, IO71 and IO72a). Approximately 28%? of the sector's final demand is from other sources than government.

Approximately half of that impact is realised as a direct consequence of increased activity in the HEIs themselves, whereas the other half is generated via "knock on" effects in other sectors, particularly the retail and service sectors. The total change in output and employment, and the distribution across sectors is summarised in Table 4. These impacts are shown graphically in the darker shaded bars in Figures 3 and 4.

Table 4 Impact of £100m increase in final demand for London HEIs

| Sector	Change in Final Demand (£m)	Output Impact (£m)	Employment Impact (FTE)	Change in Final Demand (£m)	Output Impact (£m)	Employment Impact (FTE)
Primary and utilities	0	12	31	0	0	1
Manufacturing	0	38	200	0	0	-1
Construction	0	10	57	0	4	20
Distribution and retail	0	34	371	0	-3	-28
Hotels, catering, pubs, etc.	0	11	149	0	0	3
Transport, post and communications	0	20	140	0	-3	-22
Banking and financial services	0	18	65	0	-4	-13
House letting and real estate services	0	25	38	0	2	3
Business and other services	0	23	262	0	-9	-96
Public sector	0	16	187	-100	-109	-1,313
HEIs outside London	0	0	3	0	0	-4
London HEIs	100	101	1,350	100	101	1,348
	100	**309**	**2,855**	**0**	**-20**	**-102**

A more complex picture emerges with expenditure switching. The Type-II multiplier for other public expenditure in England is 3.29. If an increase in HEIs funding were to be met by cutbacks in other English public expenditure the 'multiplier' for switching is equal to 3.29-3.07=-0.22[14]. That is to say, for every £100 million directed from the public sector to HEIs the output impact of switching is -£22 million. In particular the estimated import propensity of London HEIs is greater than the public sector's import propensity. Therefore for every £1 spent on HEIs less is retained within the regional economy than for government spending in general. A qualitatively similar result emerges for employment impacts. However, we find that this switching effect is

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[14] For further discussion of analysing the impact of expenditure switching within an IO context, see Allan et al (2007).

actually positive for Scotland, Wales and Northern Ireland, where substitution of expenditure on HEIs from the public sector generally has a net expansionary effect.

If we proceed "as if" there is a regional public expenditure constraint this implies that multiplier effects on individual sectors are no longer universally positive, as in the conventional case. The net changes are again shown in Table 4 and in the lighter shaded bars in Figures 2 and 3. In particular, there is a significant contraction in the public sector and a net contraction in other sectors that are sensitive to changes in general public expenditure, rather than to the expenditure on output in the HEI sector. In a UK devolved context, changes in public expenditure, determined by the regional government and therefore financed through Barnett, typically involve expenditure switching. However, even where, as for England, there is no binding expenditure constraint, we can investigate the opportunity cost of alternative uses of public expenditure within the region, by illustrating what happens if the public funding for HEIs were used instead to expand the public sector in England. The multiplier effects if we allow for alternative uses of public funds are in general more subdued. Indeed, even the direction of the net impact cannot be known *a priori*, and in the case of London HEIs the net impact is a contraction in demand. This is a crucial result that appears not to be widely appreciated in existing impact studies.

Figure 2 Output impact of £100m increase in final demand for London HEIs
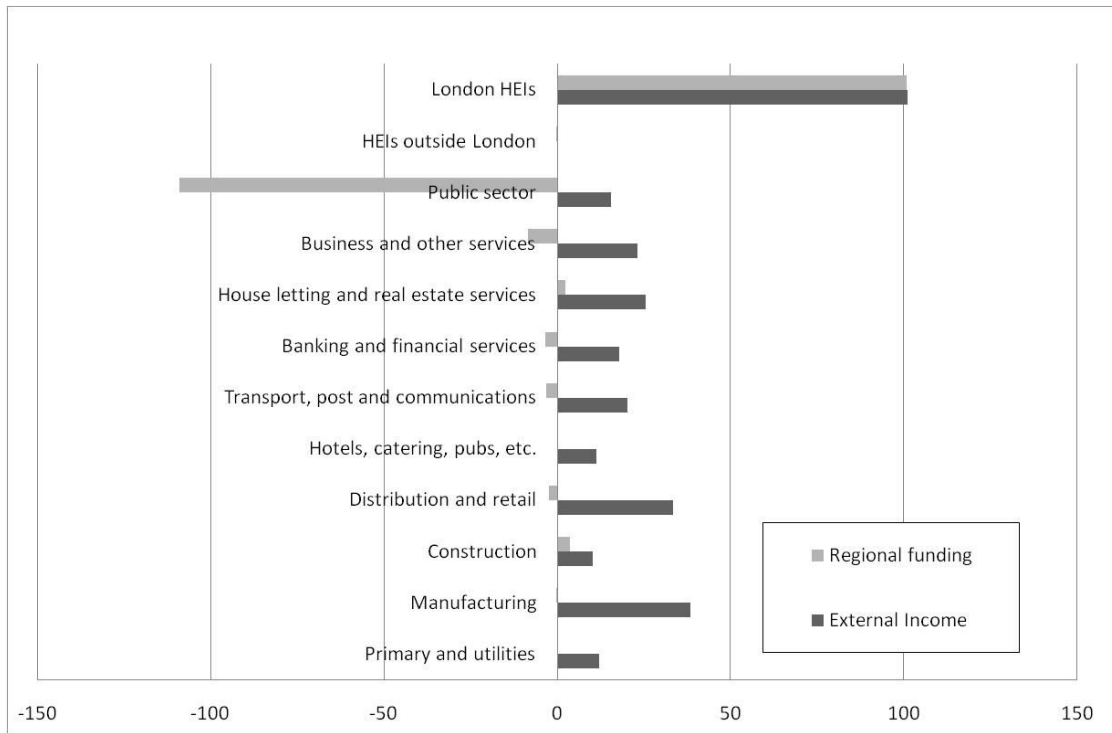
Figure 3 Employment impact of £100m increase in final demand for London HEIs
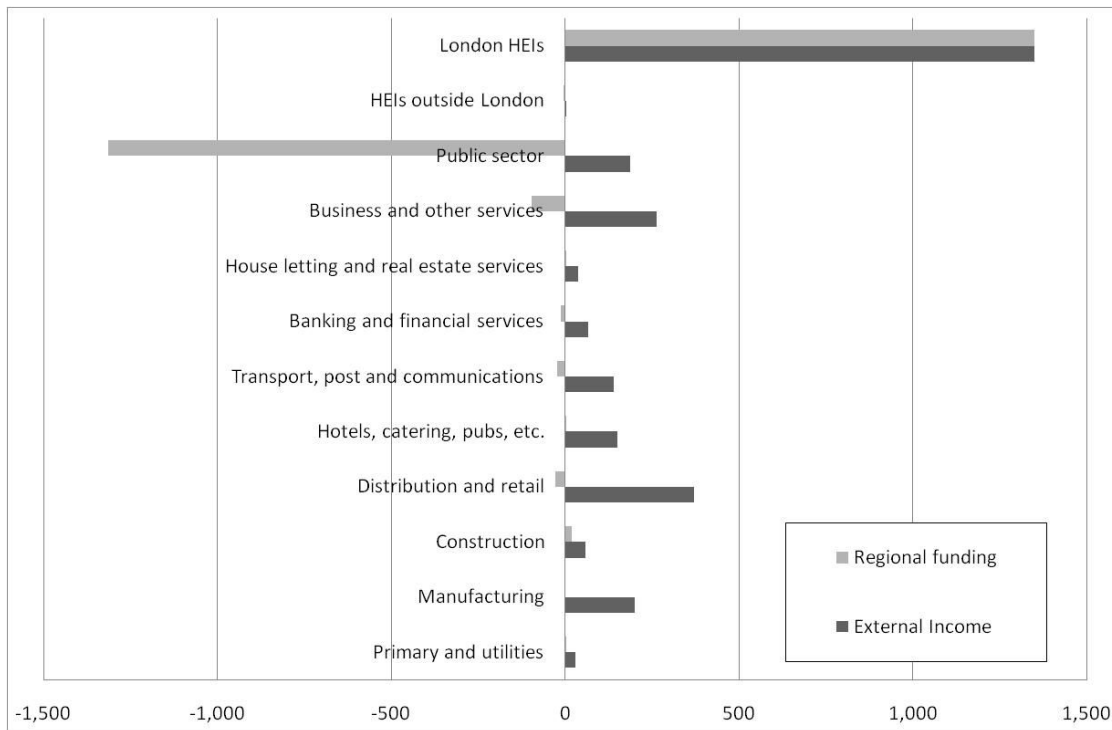

As can be seen from the analysis above, care must be taken in determining the source of financing for any impact study applied to a region wherever any use of public funds is involved.

While the example of HEIs is used here, the principle is, of course, quite general. It is desirable for regional impact analyses to account for the alternative uses of public funds.

These results might be interpreted as suggesting that the impact of HEIs' spending on the economy of England is very limited (and negative), because of expenditure switching within England, since in the absence of HEIs the funding would simply be allocated to public services there. However, while HEIs are often perceived to be part of the public sector they are in fact non-profit organisations. An analysis of their income based on data from HESA (Hermannsson *et al*, 2010c) reveals that well under one half (43%) of their income can be traced back to public funding. Approximately 29% stems from sources outside England and approximately 28% originates from households, businesses, charities and other institutions whose funding is independent of the block grant. The external income is unambiguously additional to the English economy and it is reasonable to assume the latter part is as well. Even if taking account of alternative uses of public spending would imply complete crowding out of public spending on HEIs within the region, only a part of HEIs' activities is publicly funded. In fact, HEIs are characterised by considerable exports (to the rest of the UK and the rest of the world), and changes in export demand do not trigger any offsetting expenditure switching among final demands. The sources of income of London HEIs are given in Figure 4. In the next section we explore the significance of this pattern of funding for the attribution of HEI impacts on the host region.

Figure 4 Income structure of the HEIs sector in the HEI-disaggregated Input-Output tables
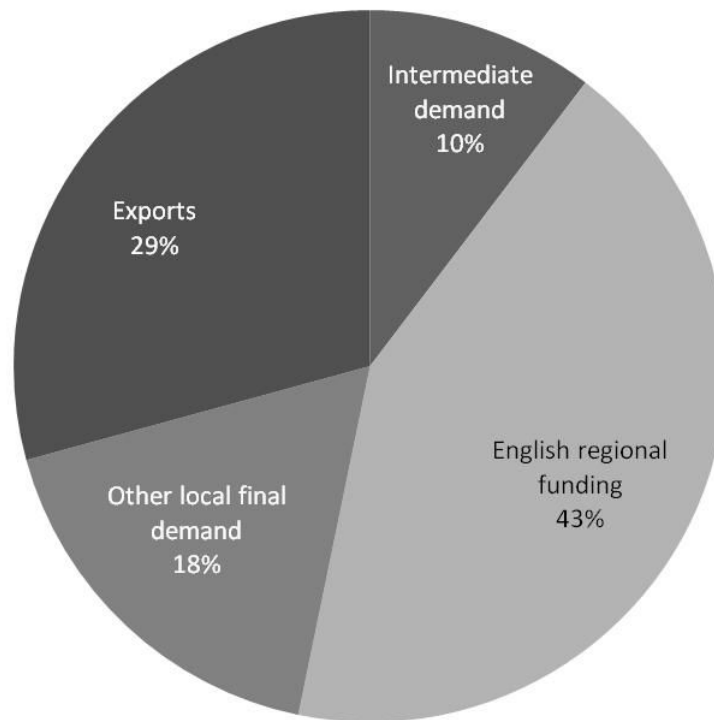
4. Accounting for alternative uses of public funds within the Input-Output framework

The Input-Output tables provide a useful accounting framework. Based on the dichotomy of exogenous (final demand) and endogenous ('knock-on' effects) activity, each sector can be attributed with the total activity driven by its final demand within the regional economy. While this activity can be measured in terms of output, employment or GDP we illustrate our approach using output. The total impact of HEIs on output is composed of both the final demand for the output of the sector and also the knock-on impacts on other sectors, through directly and indirectly linked intermediate demand and household consumption. One key strength of Input-Output as an accounting framework is that it is consistent. When such an attribution exercise is

carried out on a sector by sector basis, the sum of the impacts attributable to each sector equals the economy-wide total[15].

As discussed in the previous section, one of the criticisms levelled against deriving the economy-wide expenditure impact of HEIs in such a way is that, given their funding arrangements in England, attributing HEIs with the impact of spending public funds is disingenuous. Such an impact is not so much caused by the HEIs *per se* as it is by the availability of public funds and potentially similar results could be obtained if the funds were to be switched to be spent on other public services.

The Input-Output framework, combined with detailed information about the income sources of HEIs, enables a disaggregation of the sector's impacts in terms of the origin of the exogenous final demands. This allows an analysis of the extent to which the impacts attributed to the HEI sector under a traditional IO approach should in fact be attributed to general government expenditure.

Based on conventional assumptions, London HEIs account for 0.47% of Gross Output, 0.53% of GDP and 0.61% of employment in England. Adding the impact of student's consumption spending as derived in Section 2, London HEIs support 0.64% of Gross Output, 0.71% of GDP and 0.75% of employment in the region. Taken at face value it is clear that the sector is important as a supporter of employment and output within the regional economy (and, of course, we are here only analysing the impact of London-based English HEIs). The controversy concerns whether the traditional IO-accounting approach may be providing a misleading estimate of the sector's contribution.

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[15] Moreover, the validity of this attribution method does not rest on the same strict assumptions as identified for IO modelling in Sections 2 and 3. For example, CO_2 attribution analyses of the type associated with the carbon footprint is most rigorously calculated using IO tables.

In order explicitly to take account of the public expenditure switching effects, as discussed in Section 3, we deduct the impacts of the government funding from the overall expenditure impact. The direct expenditure on the output of English HEIs is divided into government funding (BF), reflecting the fact that for regions that are actually devolved this funding is governed by the Barnett formula, and other funding (OF) which includes all other sources, including exports to the rest of the UK and the rest of the World. The conventional attribution to HEIs is simply $(BF+OF)M_H$, where M_H is the multiplier value for the HEIs sector. The results of this attribution are summarised in Figure 6. The adjusted attribution subtracts the Barnett funded element and its own multiplier effects, which equals BF^*M_P where M_P is the multiplier for the aggregated public sector. The adjusted attrribution is therefore given by equation 3.

$$(BF + OF)M_H - BF * M_P = OF * M_H + BF(M_H - M_P) \qquad \text{Equation 3}$$

To summarise, the output impact of HEIs net of government funding equals the output impact attributable to other funding sources OF^*M_H in addition to the switching impact $BF(M_H\text{-}M_P)$.

To clarify, the impact of government funding on HEIs can be re-arranged into a 'generic' public expenditure impact and a 'net' impact. The output impacts of the HEI sector are illustrated in these terms in the lower bar of Figure 5 below. As the diagram reveals, when the expenditure impact of HEIs is disaggregated according to the source of income, only 55% of it can be classified as a generic public sector, leaving 45% of it as a net impact, that is not dependent on public funding.

Figure 5: Output impact of HEIs disaggregated by origin of final demand. Upper bar shows the components of the gross impact while the lower bar breaks the impact into a generic public sector impact and net impact by implementing expenditure switching, £ million
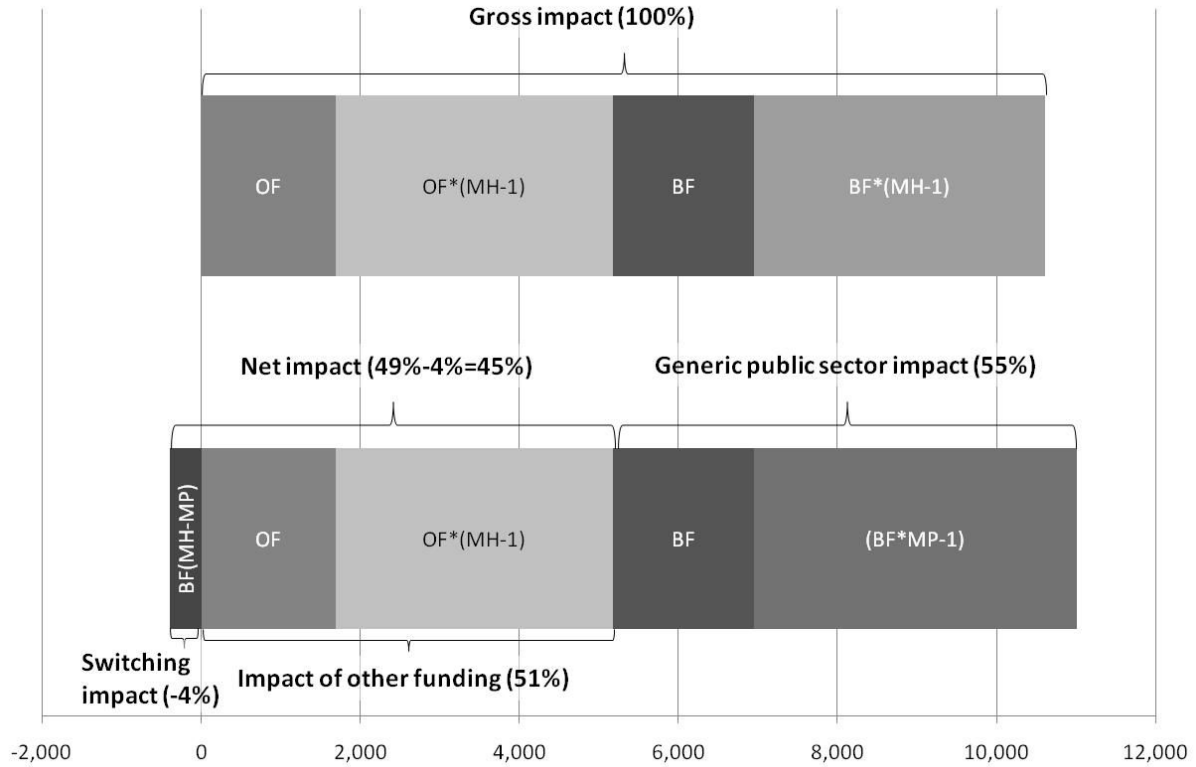
An exactly analogous argument can be made in respect of the appropriate treatment of student expenditure impacts. In this case we have:

$$(BF_S + OF_S)M_S - BF_S * M_P = OF_S * M_S + BF_S(M_S - M_P) \qquad \text{Equation 4}$$

Where, BF_S is student's consumption final demand attributable to Scottish Government student support[16], OF_S is students' exogenous final demand for consumption from other sources, M_S is the output multiplier for students' consumption expenditures and M_P is the output multiplier for the public sector.

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[16] A part of English students' expenditures is funded by student support grants provided by the government. For details see Appendix.

When students' consumption expenditures are analysed in this way the results are, in the case of London, similar to those for the HEIs' institutional expenditures (though the same is not true of other regions, where the switching to HEIs expands demand). Primarily due to the strong direct import component of students' consumption expenditures the output multiplier is smaller than for public sector expenditure *per se* (as is also true for Northern Ireland, Wales and Scotland). In this case England gets a smaller demand stimulus for public funding of student support than on other public expenditures on average. In this case the switching impact is negative, as it is for HEIs' institutional expenditures in the case of London. The impact of students' consumption expenditures has been combined with the impacts of HEIs institutional expenditures in Table 5 below.

Table 5 Summary of overall spending impacts attributable to HEIs, by origin of final demand and type of impact (output, £m).

	Generic public sector impact	Net impact	Gross impact
Institutional spending	1,774	1,686	3,459
Knock on impacts	4,064	3,486	7,550
Switching impact		-395	-395
Institutional impact total	**5,837**	**4,777**	**10,615**
– % of total impact	*55%*	*45%*	*100%*
Exogenous student spending	337	1,394	1,731
Knock on impacts of student's consumption	772	1,765	2,537
Switching impact		-346	-346
Student's consumption impact total	**1,110**	**2,813**	**3,923**
– % of total impact	*28%*	*72%*	*100%*
Total impact attributable to HEIs	**6,947**	**7,591**	**14,538**
– % of total impact	*48%*	*52%*	*100%*

This section has examined the impact attributable to the HEI sector in England in more detail than impact studies usually do. In addition to the traditional approach of attributing the sector

its impact (as the final demand for institutional expenditures times the HEI multiplier plus the direct impact of exogenous student's consumption expenditure times the student consumption multiplier) the origin of the final demands is examined and knock-on impacts attributed to each of these. In an accounting sense the total impact of the HEI sector is the same in each of these exercises. However, the impact is disaggregated into components that reflect the origin of the exogenous demand.

Although overall the impact of HEIs is unchanged by this attribution, the analysis reveals that there is some justification for a degree of policy scepticism based on alternative uses of public funds. Some 48% of the impact of the HEI sector in England reflects a 'generic' public spending impact that would have materialised anyway had the public funds been used to expand the host region's public sector. Indeed there is a small negative 'switching impact' of public funding for HEIs' own expenditures and for students' consumption expenditures.

However, the analysis also reveals that the extreme form of policy scepticism, which argues that once the public budget constraint has been accounted for the impact of the HEIs' expenditures on the host region is negligible, is not supported by the evidence. Indeed, 52% of the sector's impacts are additional to the public expenditure impact. These are attributable to funding from sources independent of government expenditures and the consumption expenditures of students that are not supported by public funding.

5. Conclusions

In this paper we replicate our analysis of Scottish HEIs' expenditure impacts (Hermannsson *et al* (2010a)) to explore the impact of London HEIs' expenditures on the economy of England. The paper is intended to provide a self-contained, accessible source of information for user groups

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whose primary interest is in the impact of London HEIs. While we include brief comparative comments in this paper, our focus is primarily on the London results.

A "policy scepticism" appears to have developed that constitutes a major challenge to studies of the regional impacts of HEIs. In the limit this policy scepticism suggests that the expenditure impacts of HEIs on their host regions are negligible, and can therefore be ignored. We reject the strict binding resource constraint rationale for policy scepticism on *a priori* grounds. While we acknowledge the likely importance of supply side constraints in the English (and London) economies, we retain an IO approach throughout the present analysis. However we do recognise and accommodate the significance of alternative uses of public funds. In the present English context, of a region not subject to a binding public expenditure constraint, we argue that it is nevertheless useful to explore the consequences of an alternative use of public funds (which we here take to be general public sector expansion). We build this opportunity cost into an augmented IO analysis using our purpose-built HEI-disaggregated IO table for England. Our results offer some support for policy scepticism in that we estimate that around 45% of the regional expenditure impacts of English HEIs is attributable to public funding that could generate similar (though not identical) effects if put to alternative uses such as expansion of the public sector within the host region, Conventional multiplier/ impact analyses therefore do overstate the expenditure impacts attributable to HEIs *per se*. In fact, it transpires that if funds used directly to finance the public sector in England were instead used to finance HEIs, there would be a small net negative multiplier effect reflecting the higher import propensity of London HEIs. For similar reasons the switching of public funds to students and away from the public sector would also have a net negative multiplier impact.

However, importantly, our analysis also suggests that the extreme form of policy scepticism, which denies the relevance of the regional expenditures of HEIs, is not supported by the

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evidence, at least for London (nor for Northern Ireland, Wales or Scotland). We find that around half of the impact of London HEIs on English output is attributable to funding sources other than the public sector, including export earnings. While conventional impact studies may overestimate the expenditure impacts of HEIs on their host regions, these are nonetheless substantial in the London case, and certainly not negligible as the extreme form of policy scepticism implies.

Comparing the host economy impacts of the London HEIs to our previous finding for Scottish HEIs (Hermannsson *et al,* 2010a) reveals that the London HEIs are rather less dependent on government funding and therefore the 'generic' component of the institutional impact is smaller than it is for Scotland. When students' consumption expenditures are accommodated this further enhances impacts in London relative to Scotland as student effects are larger for London than for Scotland. This is driven by three factors: the higher overall expenditure levels of students' in London; a larger proportion of incoming students, in particular from the rest of the World, and less import leakage of consumption spending. These positive forces are partially offset by more leakage for student expenditure in London than in Scotland, which results in relatively smaller knock-on impacts. The two studies are entirely comparable in their treatment of institutional impacts. However, for student impacts it should be kept in mind that the expenditure surveys carried out in Scotland and England are not identical in their reporting units or methodologies.

Our analysis is capable of extension in a number of directions. Firstly, the analysis can be applied to individual London HEIs, as well as to the London HEI sector as a whole. In Hermannsson *et al* (2010d) we show that there is considerable heterogeneity among London HEIs in terms of their dependence on public funding, and identify the significance of this for the scale of "balanced expenditure" multipliers. We obtain similar results for Wales and Scotland

reported in Hermannsson *et al* (2010e,f). Secondly, although we focus here on the expenditure impacts of HEIs, the principles of course apply equally to any sector of interest which is at least partly publicly-funded. Of course, our judgement about policy scepticism does not necessarily generalise: this will depend on the characteristics of the sector and the region. Thirdly, the analysis can clearly be applied, and indeed should be applied, to *all* impact analyses that involve any element of local public funding, to capture the alternative uses of public funds within the region. In these circumstances, researchers seeking to identify the economic activity attributable to a particular sector should acknowledge any public funding explicitly and identify the fraction of activity attributable to the public funds. In general this will reveal that a significant part of HEIs impact is in fact a 'generic' public expenditure impact and in the limit this may reveal the demand side impact of particular regional institutions to be effectively zero once alternative uses of public funds are acknowledged. However, in the case of London HEIs considered in this paper, substantial impacts can be attributed to HEIs' activity, in addition to those driven entirely by local public expenditures.

Finally, it should be noted that our analysis in this paper is, in common with conventional regional impact analyses, focussed solely on the expenditure or *demand-side* effects of HEIs. This is a rather restrictive context in which to consider policy impacts. So we would not, for example, advocate the use of estimated net "balanced expenditure" multipliers to decide on the distribution of projected cuts in public expenditures. Much more importantly in the case of HEIs, at least, is that we would expect many of their impacts on regional economies to come through the direct stimulation of the supply side, for example, through their impact on the skills of the host region's labour force and through knowledge exchange activities. These impacts can only be explored in a framework that explicitly accommodates these supply side effects, so that input-output analyses are inadequate to the task, even if, as here, they are augmented to accommodate regional public expenditure constraints. This may be particularly important for

policy given that there is some evidence that supply-side effects may be large relative to the expenditure effects of HEIs (see e.g. Hermannsson *et al*, 2010b).

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Appendix: Derivation of student's consumption expenditure

This appendix presents the details of how the impact of students' consumption expenditures was derived. This draws on a study by Johnson *et al* (2009a). They interviewed 2,686 English domiciled undergraduate students and collected expenditure diaries from 2,335 of those. Based on these methods Johnson *et al* (2009a) estimated the average term time expenditure at £12,254 in the academic year 2007/2008[17]. This is significantly higher than estimates for comparable groups in Scotland[18], but similar to findings in Wales (Johnson *et al,* 2009b). However, estimates between the regions are not directly comparable as Johnson *et al* (2009a,b) count tuition fees as part of student's consumption expenditures. These have already been counted as part of the HEIs expenditure impact. Thus we deduct £2,251 of tuition expenses as reported in Johnson *et al* (2009a, table 5.1, p. 141), which gives an estimate for student's term time consumption expenditures of £10,003.

However, these results only refer to a part of students at London HEIs as approximately a quarter come from outwith England (RUK 1.5% and ROW 23.6%). Surveys have not been carried out relating to the expenditure of students of RUK and ROW origin. Generally foreign students' expenditures are expected to be greater as these students are staying away from home and so must pay for accommodation in full. Johnson *et al* (2009a) compare expenditures of English domiciled student's by housing status and find significant variation, with those living in privately rented accommodation having an average expenditure of £16,769, while those living in university accommodation and those living with their parents spending £10,557 and £11,294

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[17] Although the study year is 2006 these figures were not rebased to allow for inflation. As inflation was low in the period, potential bias would be small relative to the error bounds of the original estimate. Furthermore using broad price indexes as a proxy for the prices of a basket of student consumption would bring in biases of its own. Under these circumstances it was our judgement that re-basing consumption expenditures would at best serve to enhance the perception of accuracy but would have limited impact on the acutal accuracy of the analysis.

[18] Warhurst et al (2009) estimated the average term time expenditure of Scottish domiciled undergraduates at Scottish institutions at £6,604 for the academic year 2007/08.

respectively (Johnson *et al,* 2009a, p. 121). The estimate for those on the private rental market is high and might be driven by part time students (who are generally found to have higher expenditure levels than full-time students) however, in the absence of further information about the consumption expenditures of incoming students at London HEIs we assume that 50% of them are of the private rental market type spending £16,769 a year, and that the remaining 50% are of the type living in university accommodation, spending £10,557 a year. Thus we expect the average consumption of incoming students to be £13,663.

A number of adjustments have to be applied to the 'gross' student spending as reported by Johnson *et al* (2009a) to conform with IO assumptions. (Their main findings on student spending in London are outlined in Table A2 below.) In particular, care must be taken to deduct non-additional ('endogenous') spending components to avoid double counting. So we need to be careful to deduct tuition fee expenditure as these have already been counted as part of the institutions' income. These are attributed to student expenditure in Johnson *et al* (2009a).

For English domiciled students this means that the components of consumption that are treated as additional (exogenous) are those that are attributable to student loans (source of income support less tuition fee support), social security benefits as reported by Johnson *et al* (2009a) and our estimate of new commercial credit taken out by students to support their studies (as detailed below).

This changes slightly if we were to acknowledge a budget constraint of public expenditures in London of a similar kind as that of the devolved regions (Scotland, Northern Ireland and Wales). Under those assumptions student support would represent a re-allocation public spending within England (see general discussion in section 3). The student loans received by English students in London are however treated as additional as they are provided by the Student Loans

Company, a UK-level non-departmental public body. Informal transfers within the family do not constitute additional spending in England as they are a re-allocation of total household spending[19]. Term-time labour market earnings are equally not-additional to the English economy as under IO assumptions, of a passive supply-side, if the student was not earning that wage income some other England resident would be. That leaves other income, which is assumed to be endogenous to the England economy[20] and the student's income shortfall (expenditure in excess of income). Precise information is not available on the composition of this income shortfall, but it can be expected to constitute some combination of informal income/credit not previously accounted for and commercial credit. New commercial credit taken out by England domiciled students represents an exogenous impact on the local economy, while informal credits are assumed to be obtained locally and therefore represent a transfer within the economy rather than an additional impact. Johnson *et al* (2009a, Table 6.3, p. 196) find that average commercial credit taken out over the academic year equals £854 (thereof 'Commercial credit' = £440 and 'Overdraft' = £414).

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[19] In principle parents could be funding these transfers by drawing on savings or taking out new credit, but we assume they are met with consumption switching from parents to student.

[20] Detailed information on the composition of other income is not available but it is reported to include "maintenance payments for students' own or partner's children; money from pensions, trusts, deeds of covenant, shares, tax refunds, and bank or building society interest and windfalls; rent received from lodgers; and contributions towards rent/living costs or gifts of money from organisations (not captured elsewhere). In addition, money generated through the sale of items such as books, computers, course equipment, and any other items" (Johnson *et al,* 2009a, p. 80). Many of these are endogenous and hence non-additional to the English economy. We adopt the conservative stance that this applies to the whole category.

Table A1 Average term time income and expenditures of English undergraduates, £. Source: Johnson et al (2009a, Table 2.1 & 4.1, pp. 18, 118).

	£	% of income	% of expenditure
Average total income	**10,426**	**100%**	**85%**
Main sources of student support	4,771	46%	39%
Other sources of student support	1,025	10%	8%
Income from family and friends	2,045	20%	17%
Term-time earnings	2,108	20%	17%
Social security benefits	258	2%	2%
Other income	219	2%	2%
Average total expenditure	**12,254**	**118%**	**100%**
Housing costs	2,455	24%	20%
Living costs	6,496	62%	53%
Participation costs	3,151	30%	26%
Child specific costs	152	1%	1%
Dissaving	**1,828**	**18%**	**15%**

Johnson *et al* (2009a) estimate the average term time employment income of English undergraduates at £ 2,108. Here it is assumed that this average holds for incoming students from other parts of the UK, while foreign students are assumed not to participate in the labour market. Finally we deduct the direct import content of student's expenditure, which is assumed to equal that of English households in general (13.4%) as reported in the English Input-Output table.

Table A2 Derivation of per student spending

Location of domicile		England	Rest of the UK	Rest of the World
Gross average student spending £	+	12,254	13,663	13,663
Income from employment £	-	2,108	2,108	
Within household transfers £	-	2,045		
Other income £	-	219		
Dissaving £	-	1,828		
Tuition fee expenses	-	2,251	2,251	2,251
Spending attributable to new commercial credit £	+	379		
Exogenous average per student spending	**=**	**4,182**	**9,304**	**11,412**
Direct imports £ (13.4%)	-	559	1,243	1,524
Net change in final demand per student £	**=**	**3,623**	**8,061**	**9,888**
Number of students FTE's	x	217,245	4,317	68,582
Estimated net contribution to final demand by student population £ m	**=**	**787.1**	**34.8**	**678.1**

Having estimated the students' net contribution to final demand it is possible to estimate the knock on impacts of their consumption spending. A student expenditure vector estimated by Kelly *et al* (2004) is used to derive the spending impact of the different student groups in London. In total they support approximately 0.17 of output.

Table A3 Impact of student spending in London

	Student origin			
	England	Rest of the UK	Rest of the World	Total
Output impact of student spending £m	2,059	91	1,773	3,923
% of Gross Output	*0.09%*	*0.00%*	*0.08%*	*0.17%*
GDP impact of student spending £m	*1,007*	*45*	*868*	1,920
% of GDP	*0.10%*	*0.00%*	*0.08%*	*0.18%*
Employment impact of student spending FTEs	*13,708*	*606*	*11,810*	26,124
% of London employment	*0.08%*	*0.00%*	*0.07%*	*0.15%*