

# Outputs and Outcomes: Quantifying the impact of higher education institutions

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University-Business Interactions Workshop  
University of Cambridge  
4-5 June 2009

## Higher education ‘impact’ is broadly thought to encompass :

- The impact of a university or college as a business and the higher education sector as an industry
- Higher education increasing the skills base and ‘absorptive capacity’ through its students and graduates
- Research and innovation and the transfer of this knowledge to the host economy
- Creation of *Externalities*: social, cultural and environmental impacts

## Why quantify Higher Education Impact?

- Policy Drivers

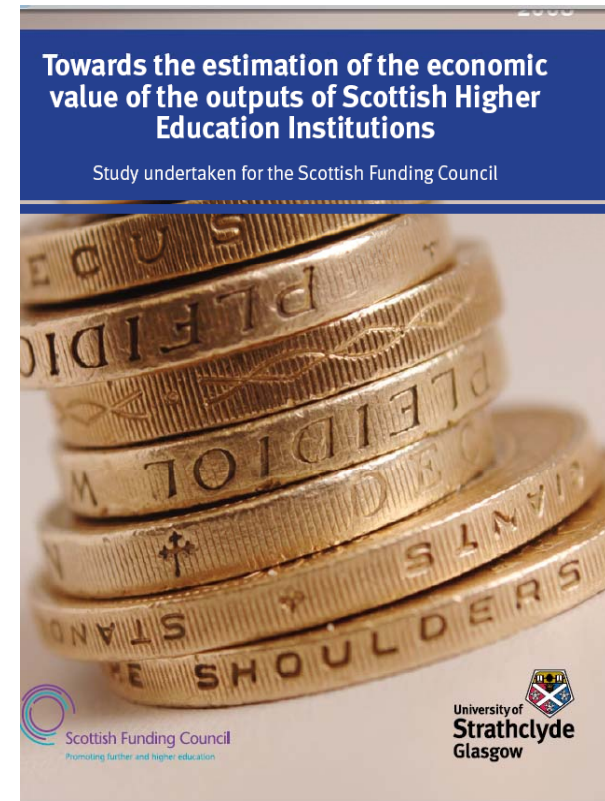
- Growing attention being paid to higher education's impact on the economy and society
- Government seeking evidence for return on public investment
- Justification for government expenditure
- Public funding for higher education institutions increasingly linked to evidence of 'impact'
- Desire for development of 'performance indicators' or 'metrics' to inform resource allocation

## Difficulties in measuring impact

- Complex relationship between UK HEIs and government and crucial importance of differentiating between higher education **institutional outputs** and government's **wider desired outcomes**
- Current difficulty with the policy drive to emphasise the 'impact of HEIs' and to develop measurements of HEI impact is a tendency to focus on how to measure *outcomes*
- But only metrics based on *outputs* can give meaningful performance indicators for **HEIs**

*Towards the estimation of the economic value  
of the outputs of Scottish higher education institutions*

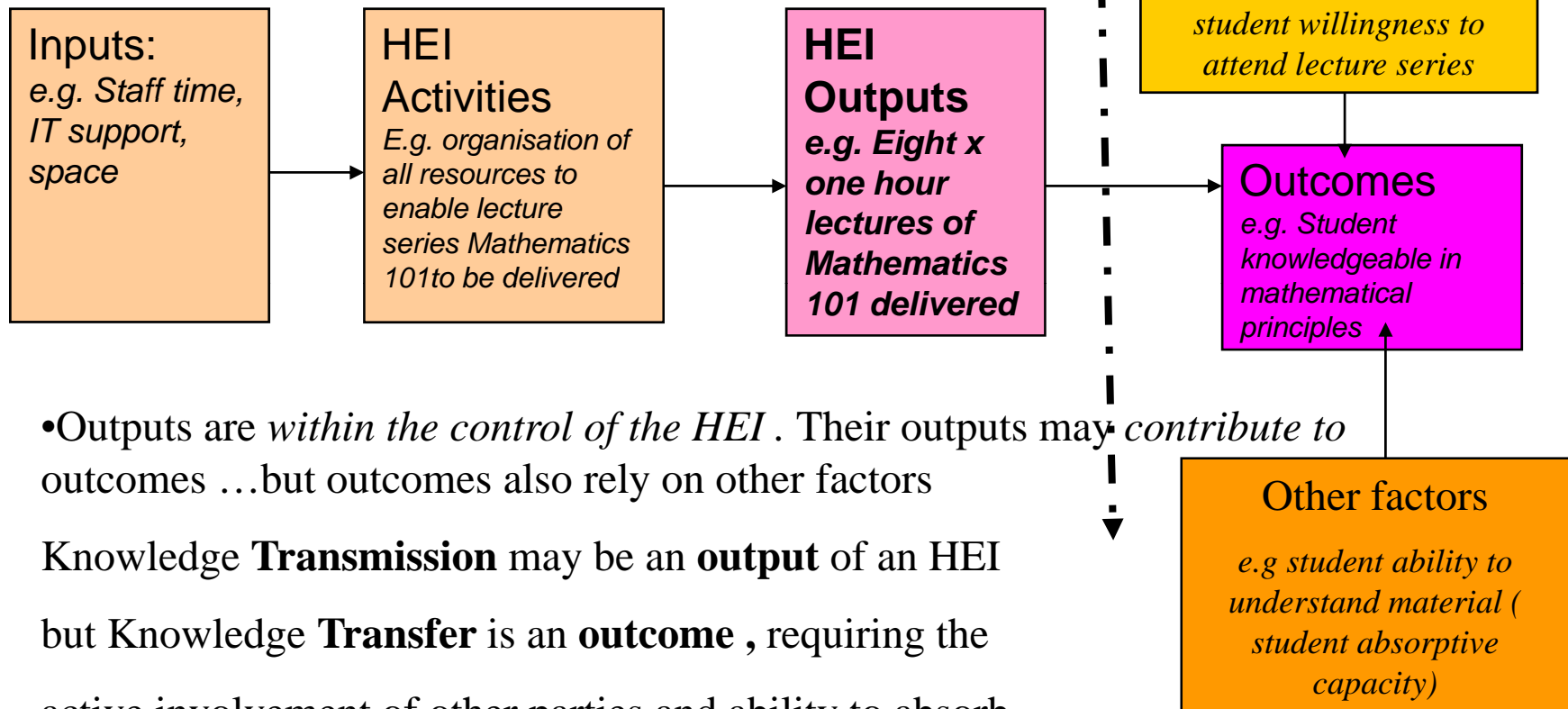
- Building on previous work on impacts of HEI expenditure ( for Universities UK, Universities Scotland etc )
- Sought to develop new approach to capture value of all that HEIs do
- Initial pilot case study supported by Nuffield Foundation 2004
- Further Methodology development report and pilot application in two further projects funded by the Scottish Funding Council (2005 & 2008)



## Terms, Definitions, Concepts

- Used fundamental principles of applied economics and statistics conforming to recognised international best practice for compilation of economic statistics
- Used core definitional sources (*eg the European System of Accounts (ESA 95) , the SNA etc*)
- Focussed on the **Higher Education Institution ((HEI) not** 'Higher Education' in general
- We focus on the **outputs** of HEIs i.e what the HEIs actually produce

## Outputs and Outcomes



•Outputs are *within the control of the HEI* . Their outputs may *contribute to* outcomes ...but outcomes also rely on other factors

Knowledge **Transmission** may be an **output** of an HEI but Knowledge **Transfer** is an **outcome** , requiring the active involvement of other parties and ability to absorb

the knowledge transmitted. Hence an HEI cannot be measured on its success in knowledge transfer as this is beyond its boundaries.

## Quantifying outputs enables analysis of economic value

- The higher education sector is an industry comprising enterprises (HEIs) using economic resources to produce economic outputs
- Quantification of these outputs in both volume and value terms can enable analysis of HEI economic value

Value = quantity of output produced x price per unit of output

## A set of comprehensive quantitative measures of HEI outputs would:

- Enable the contribution of the HEI sector to be assessed in terms comparable with other industries
- Enable evaluation of efficiency and effectiveness ('value for money')
- To assist in resource allocation issues and create signals for HEIs to encourage allocative efficiency
- To find a way to capture the value of 'invisible' or non-commercial higher education contributions to public policy development and to cultural and community engagement
- Create a statistical data set for the HEIs that is likely to be required in due course to meet UK and European statistical requirements for public and third sector bodies

# Basic steps – procedural framework

(1)+(2) +(3)  
provides  
value  
measures  
of HEI  
outputs.  
This can  
give size  
and growth  
measures  
in terms of  
GDP and  
inform  
BOTH cost  
efficiency  
AND  
**allocative**  
efficiency  
calculations

1. Definition and Identification of outputs (- *what a HEI produces – e.g. Teaching, research, community workshops, concerts, public lectures etc*)

2. Quantification of outputs  
- Volume terms  
- *how much of each output does the HEI produce*

3. Identify prices to be applied to the outputs

(1)+ (2) Can be used to derive indices of production, to analyse growth, productivity, cost/technical efficiency

- *ALL HEI outputs are, in principle, quantifiable in natural volume units*
- *But many HEI outputs are **non-market***

## Shadow-Pricing Non-market outputs

- HEIs are not unique in producing non-market outputs
- Recognised ways exist of imputing a value to non-market outputs ( and are used by the World Bank, UK Treasury Green book etc)
- These include finding parallel markets ( ‘free market’ , equivalents), using ‘contingent valuation’- willingness to pay, willingness to accept - ‘hedonic pricing’, ‘Travel cost’ or ‘Time cost’.

## Relevant measures of value

- Financial value - actual revenues received for HEI outputs
- Economic value – applying economic efficiency prices to HEI outputs
- Social Value – application of social weights to economic value

SOME EXAMPLES OF USING TIME COST FOR NON MARKET OUTPUTS						
Type	Description	Number/opening length	Av Visitor no	Estimated length of visits	Total time spent	Economic value
Temporary exhibition	James Joyce Exhibition	6 weeks, 6 day week	30/day	45 mns on average	6x6x30x45 =48,600 hours spent	Hours spent x DfT hourly rate for leisure time hourly rate ( £4.46 2002 prices) = £216,756
Public Lecture	Annual Astronomy Guest Lecture	1 hour	200 attendees		200 HOURS SPENT	Hours spent x DfT hourly rate for leisure time hourly rate ( £4.46 2002 prices) =£892
External Library visitors	External Library memberships	FTE Number (from SCONUL) 400	Est. annual no. of visits per FTE user (from SCONU) 64	EG. 1.5hours	400x64x1.5 =2880 hours spent	Hours spent x DfT hourly rate for leisure time hourly rate ( £4.46 2002 prices) =£51,200

# Impact of

## Higher Education Institutions on Regional Economies

### A Joint Research Initiative

Public Policy Advisory Activity Examples using parallel market						
Type	Description	Type of staff (Senior academic/ Professor, Lecturer, Senior Manager ( etc)	How Many staff	Approx time involved	Paid?	'Parallel market' or Free Market price comparison
Parliament Adviser	Advisor to Rural Affairs Committee	Senior Academic	1	15 days per year	Expenses only	Commercial consultancy rate for senior expert consultant
Member of Government Expert Advisory Group	SG Statistics Expert Users Advisory Group	Senior Academic	2	4 mtgs/yr x 3 hr mtgs	None	Commercial consultancy rate for senior expert consultant
Member of public policy network group	Local NHS Trust pharmacy network	Lecturer	3	Varied estimate 4 hours/month input per member of staff	None	Commercial consultancy rate for expert consultant
Board Member Government Agency	Regional Development Agency	Senior Manager	1	6 mtgs/yr x 3 hour nmtgs	Nominal/ honorarium	Commercial consultancy rate for senior expert consultant
Board Member Government Agency	Local NHS Trust	Senior Academic	1	6 mtgs/yr x 3 hr mtgs	Nominal/ honorarium	Commercial consultancy rate for senior expert consultant

# Some final remarks...

- It **is** possible to estimate the economic value of what HEIs do
- Vital for this to be holistic – for *all* aspects of HEI work to be included
- Informed resource allocation decisions about higher education **need** estimates of economic value and social value
- But this cannot be done by immediately jumping to ‘outcomes’ or ‘impacts’ – it is essential to identify & quantify HEI **outputs** in the first instance
- Without knowledge of HEI outputs no meaningful measures of efficiency (outputs/inputs) can be derived *and* the *future* development of measures of effectiveness (outcomes/outputs) will remain unattainable