



infrastructure **business**
models, valuation and
innovation for **local delivery**

***Expanding the scope of economic valuation in
HM Treasury's Green Book***



UNIVERSITY OF
BIRMINGHAM



Newcastle
University



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EPSRC

Engineering and Physical Sciences
Research Council



Introduction

Aim:

- Introduce recent work of iBUILD on economic evaluation of infrastructure
- Specifically the iBUILD/Leeds Report, edited by Andrew Brown and Mary Robertson:
- *Economic Evaluation of Systems of Infrastructure Provision: Concepts, Methods, Approaches*

Context

- iBUILD work on economic evaluation of infrastructure provision brought into focus by contribution to ‘Strategic Infrastructure Interdependencies Valuation’ Group
 - value of “systemic resilience”
 - value of “passive provision”
 - goal of supplementary Green Book guidance
- Where in iBUILD and Leeds to look for help?
- Everywhere

Infrastructure economics in iBUILD and Leeds

- Heterodox economics and political economy
 - ‘systems of provision’ approach
- Financial economics and financialisation studies
- Ecological and environmental economics
- Transport economics
- International Business economics
- Decision making, risk assessment and project appraisal
- New developments in economics (e.g. behavioural, happiness, complexity)
- Synergies with engineering and environmental science

Infrastructure economics: a useful collective term?

- All can claim to contribute in diverse ways to ‘infrastructure economics’
 - Not a branch of economics that is currently recognised!
 - Typical characteristics of infrastructure not easily reconciled with standard assumptions in economics
- The report offers a selection of the range of approaches across iBUILD / Leeds

Structure of the report

Introduction

1. The Economics of Infrastructure
2. Valuing systemic transport resilience: methods and evidence
3. Decision making under uncertainty: methods to value systemic resilience and passive provision
4. Economic evaluation of passive provision in sustainable energy provision
5. Valuation of passive provision for heat network investments
6. Accounting for critical materials in sustainable energy provision: maintaining systemic resilience

Conclusion

Recurrent themes

- Systematicity
 - Infrastructure as a systems of systems serving the wider socioeconomic system as a whole
- Uncertainty
 - Distinction between calculable *risk* and ‘fundamental’ or ‘deep’ *uncertainty*
 - Knight
 - Keynes

Some highlights in the report

- The potential for **iterative methods** to improve decision making under uncertainty;
- The need to **incorporate wide-reaching and multidimensional interdependencies** into evaluation and appraisal;
- That **institutional and regulatory challenges** are likely to confront any attempt to implement reformed methods of evaluation and appraisal;
- That seemingly simple technological decisions may be inextricably linked with **political and environmental considerations.**

Future challenges raised

- Better understanding and measuring **non-marginal** or **wider economic effects**;
- Incorporating **endogenous preferences** into analysis;
- Achieving a better balance between quantitative and qualitative appraisal, in order to enable a **multidimensional assessment of value**;
- Addressing the role of **power, institutions, and politics** in infrastructure assessment and delivery;
- Confronting challenges of **implementability**, particularly with regard to methods for dealing with uncertainty.

Suggested ways forward

- Development of both **standard** and hitherto **non-standard** economic approaches further along the lines developed in the report
- Standard economics an essentially ‘marginalist’ theoretical approach to valuation
 - Partial equilibrium microeconomics of externalities or market failures
- Non-standard economics rooted in non-marginalist theory of valuation
 - Can address the system-wide (macroeconomic), i.e. ‘non-marginal’ effects of infrastructure

‘System of provision’ approach

- The Report’s conclusion introduces the ‘**systems of provision**’ approach
 - A non-standard approach rooted in political economy
- Units of analyses are commodity-specific chains of provision, ‘systems of provision’ (‘sops’ for short)
- sops encompass the entire chain of activities and agents involved in the provision of a good, including financing, production, distribution, marketing and consumption.
- The specific character of a sop as an integral whole derives ‘from the material and cultural properties of the commodity or service in question as well as the wider context’
- Material and socioeconomic aspects of sops thus integrated

Systems of infrastructure provision

- Application of sop approach to infrastructure is beginning to take off
 - Robertson's, Bayliss's and Fine's ongoing work in FESSUD (EU FP7) project
 - EPSRC Demand Centre research based at Lancaster
 - CVORR (NERC-ESRC) just started at Leeds
- Offers potential to address many themes identified in the report
- An aim of future iBUILD economics research is to help realise this potential, integrating sop approach with other approaches

Conclusion and future potential

- The iBUILD/Leeds report is in part intended to feed into immediate work on Green Book
- It also suggests longer-term possibilities of bringing together infrastructure economics research
- Future possibilities for more systematic working across academic perspectives and disciplines
- And for working with and across Govt. (including IUK) and full range of stakeholders

Conclusion and future potential

- Much potential to develop further in time
- Integrate with related work of iBUILD / Major Projects Association (Prof. Denise Bower)
- Draw in more fully from Newcastle and Birmingham partners
- Bring in more fully engineering, environmental and social considerations
- Incorporate finance and ‘financialisation’
 - e.g. draw on FESSUD project; develop notion of ‘financial resilience’
- Bring in further stakeholder input