

Assessing Regulators Fairly: Matching Scientific Knowledge With Impact Assessments

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Overview

- (R)IA as an regulatory governance innovation (Black, Lodge and Tatcher 2005)
- Diffusion (adoption highly symbolic event) vs. institutionalisation (routine of evidence-based policy making)
- Utilisation of the best (professional and scientific) available evidence
- RQ: Have regulators utilised the best available scientific knowledge?
- Methodological contribution: To provide a (fair?) methodology for assessing the accuracy of IAs
- Empirical contribution: EU rail liberalisation

Overview

- Verifying **accuracy of IAs** estimates
- The quality of IAs should be assessed according to the best available (economic) evidence
- Research design: Matched comparison between economists' models and models utilised for 9 IAs and 7 evaluation studies. And a in-depth analysis of the quality of knowledge summarised in 2 IAs
- Main hypothesis: whether the economic models are utilised by policy analysts along the stages of a sectoral reform → (assessing the extent of diachronic learning)

Defining the quality of IAs

Accuracy is about reducing the discrepancies between predicted and actual impacts

- uncertainty over future and unpredictable change (technology change)
- the lack of scientific knowledge on the cause-effect relationship
- 'uncertainties associated with **modelling** activities, particularly in regard to any **assumptions** which have to be made by analysts' (OECD 1999: 39)

Scoring conducts

- Scoring the content of IAs is a common evaluative standard among scholars and think tanks (Hahn et al. 1999)
- **IA guidelines** and the extent of compliance
- Scorecards: **Yes/No questions** that can be aggregated in a composite indicator
- Several quality dimensions: quantification or monetization of regulatory costs and benefits (Vibert 2004, Torriti 2007); the consideration of sustainable development (Wilkinson et al. 2004, Adelle, Hertin, and Jordan 2006), and the consideration of several options (Renda 2006; Cecot et al. 2008)

Accuracy studies

- The literature on accuracy of estimated benefits and costs generally refers to cases of **environmental or risk regulations** (Hammitt 2000; Harrington et al. 2000)
- Methodological recommendations on models for predicting costs and benefits (Hammitt 2002; Matthews 2001; Matthews and Lave 2001; Torriti 2010; Torriti and Löfstedt 2012)
- Torriti (2010) reviewed only a single European Commission's IA on the liberalisation of the EU energy markets

Problems with these evaluative models

- Accuracy studies and scorecards cannot capture the extent of gap between the scientific knowledge (at the time of the production of the study) and the knowledge expressed in the IA
- These modes of evaluation are unfair. There is no attempt to verify the extent of regulators' knowledge at the time of rulemaking
- Scorecards are usually applied a large sample of IAs and useless in assessing **diachronic learning** of regulators

The EU railway reform

- Fostering **competitiveness** and **sustainable mobility**
- The reform was gradual and went through 4 comprehensive packages
- The first two regulatory reform packages were about: i) **accounting separation** between rail infrastructure and operation; ii) **access** to freight market; iii) **licences** and safety; iv) **interoperability**; v) network of **regulatory agencies** and the European agency
- The third package introduced **open access rights for international rail passenger services**
- The fourth package: open access to national passengers markets and European Railway Agency as the central authority for security and licence

The scientific knowledge on railway liberalisation

- Economists have been analysing the impact of liberalisation in enhancing productivity and efficiency of railways among developed countries
- A **productivity gain** refers to increased output relative to inputs
- **Production functions** → **technical efficiency** that is the minimisation of inputs given the level of output
- Oum et al. (1999) reviewed **productivity indexes** and **efficiency indexes**
- Indexes that can be “rated” according to the level of theoretical and analytical sophistication

Indexes of productivity and efficiency

- **Partial factor productivity:** A measure of partial factor productivity links a specific output to a single input factor, e.g. revenue tonne-kilometres per employees
- **Total factor productivity:** a ratio of a total output index to a total input index — **Decomposition** has been also used to isolate managerial efficiency from regulatory environment (Gathon and Pestieau 1995)
- **Data Envelopment Analysis** derives efficiency indexes through intensive data collection of railway companies in order to have an approximation of production frontier

Econometric models

- **Deterministic** or **stochastic** models for estimating levels of inefficiency
- Econometric models are the most sophisticated methods for assessing the impact of railway liberalisation
- Is this methodological standard recognised in the European Commission IAs on the liberalisation of the railway?

Sample of IAs and consultancy reports

- 9 IAs (2004-2017) and 7 evaluation studies on EU rail liberalisation
- Great variation of evaluation models utilised in both samples
- 6 IAs relied on **qualitative assessment** and multi criteria analysis
- 3 IAs relied on **quantitative** models
- Evaluation studies relied on i) surveys on perception of stakeholders on the impact of liberalisation (2 studies); changes of quantitative and qualitative measures (1 study); regression analysis (1 study); operational and financial data such as net present values (3 studies)

In-depth analysis of 2 IAs

- The **first IA** was officially drafted in 2004 for the 2007 liberation initiative (35 page report)
- The 2004 RIA is based on a 165-page report written by a leading UK-based transport consultancy that is available on the Internet
- The **second IA** was drafted in 2010 for the 2012 liberalisation initiative, the recast of the rail freight service. This IA is composed of 45 pages but comes with a 130 page appendix
- The 2010 IA is also based on a consultancy report that is not available on the Internet
- Dispersed **web of data and knowledge**

Assessing the scientific knowledge of IAs

- While the economic literature is concerned with technical efficiency, the IAs cover a range of (economic, social and environmental) impacts
- For instance, the 2004 report compares alternative policy scenarios according to the following dimension of welfare improvement: the volumes of passenger-km, the level of service provided to passengers, the fares paid by passengers, and the viability of the railway undertakings
- Such a range of economic impacts (beyond the rail companies' productivity and efficiency) is in line with IA guidelines and welfare economics
- But the main (political) priority of railway reform is to increase the competitiveness and the viability of the sector

Analysis of the 2004 IA

- The 2004 IA attempts to estimate the expected **revenues and costs**
- The model “simulates” the **viability** of the railway undertakings (through a prediction of revenues and costs)
- This modelling is demanding from the perspective of data reliability and the complexity of behavioural modelling of railway undertakings

Summary of the 2004 IA

- Economists have relied on indexes of productivity and efficiency in order to achieve **internal validity** and to have a **parsimonious** data collection
- In this IAs the problem of data collection was insurmountable: “The Commission has requested several consultancy firms to assess aspects of the railway markets, but it turned out to be difficult, if not impossible, to obtain reliable figures on international passenger transport by rail, such as number of passengers; passengers/km; turnover; profitability, etc. Railway undertakings are reluctant to provide these data by invoking the commercial nature of the information.” (European Commission 2004)

Analysis of the 2010 IA

- Mixed methodology
- Qualitative multicriteria analysis for comparing 3 options for liberalising rail freight service
- The preferred option was then analysed through quantitative regression models
- Independent variable: “LIB index” from the “Rail Liberalisation Index 2007” by IBM
- A set of dependent variables: Modal share of rail freight; no. of no incumbent railway undertakings; market share of no incumbents
- The IA claimed to conduct ‘a detailed cause-effect analysis’...
- but qualitative scores are used to weight the causal direct link between barrier removal and freight rail competitiveness

Summary of the 2010 IA

- The overall regression models relied on subjective judgement of the causal link
- The issue of extraneous variance since the models do not control for other possible determinants of competitiveness
- The issue of country level of analysis (economists prefer to analyse rail companies)
- Overall no discussion of indexes utilised by economists

Science vs. IAs

- Economists privilege parsimonious models that take into account the availability of data
- Economists rely on indexes of productivity and efficiency of rail companies
- The scientific knowledge has evolved over time following a progressive pattern: from simple and partial ratios of productivity to DEA models, from panel data and deterministic model to time-series and cross-sectional applications of stochastic models of the production frontier
- IAs: Scattered and not consolidated knowledge making the legibility of IAs difficult

Patterns of knowledge across IAs

- Neither has the knowledge evolved. There is a great variation in the evaluation models utilised: each IA or evaluation study tends to reinvent, or even worsen, the knowledge on the impact of railway liberalisation
- The two IAs proposed either a sophisticated model that required unavailable data or evaluative methods based on subjective judgment
- The knowledge is scattered undermining the legibility of IAs

Contributions and practical recommendations

- No practice of translating and summarising the existing scientific knowledge
- Contracting out: Consultancies tend to propose their own evaluation models → No diachronic learning
- Practical recommendation: guidelines for translating the scientific knowledge
- Evaluation methodology: Small-N and in-depth research analysis of IAs associated with a specific sectoral reform