



OCDE ORGANISATION DE COOPÉRATION ET
DE DÉVELOPPEMENT ÉCONOMIQUES

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine



PSI Online

Measuring the Social and
Economic Cost and Benefits:
Review of the Literature and
Future Directions

Presentation by:

Paul F. Uhler, Raed M. Sharif, and Tilman Merz

Outline

- Benefits of Access to and Re-use of PSI
- Government Policies
- Literature Review: Measuring the PSI Re-use Market & Linking Outcomes to Access Regimes
- Weaknesses and Challenges of Current Measurement Approaches
- Suggestions for Future Directions

Benefits of PSI Access and Re-use

- **Direct and Indirect Economic Benefits**
 - information industries develop new markets
 - other industries enhance efficiencies
 - individuals empowered as economic actors
 - public sector performance improved
 - more innovative research communities
- **Social Benefits**
 - improve political transparency
 - enhance education and research
 - support personal decision-making capabilities

Government Policies

Some Dimensions of PSI Policy

1. **Equal treatment and competition**
2. **Transaction costs to obtain PSI**
3. **Transparency of access conditions and data characteristics (meta-data level)**
4. **Accountability**
5. **Scope of public sector activity in information provision**
6. **Information quality**
7. **Access and discoverability**
8. **Pricing**
9. **Reuse**

Government Policies

Approaches between US and EU differ:

- **United States (public domain and open access default rule— Copyright Act waives rights in information produced by federal government, OMB Circular A-130 recommends dissemination of PSI at marginal cost—free online)**
- **Europe/European Union (Copyright protection & mostly cost recovery model; but: PSI Directive and Environmental Information Directive)**
- **Hybrid models with permutations of policies**

Government Policies

Compelling reasons for placing government-generated data and information in the public domain under open access conditions:

- ***Legal.*** A government entity needs no legal incentives from exclusive property rights to create information. Both the activities that the government undertakes and the information produced by it in the course of those activities are a [global] public good.
- ***Ethical.*** The public has already paid for the production of the information. Burden of additional access fees falls disproportionately on the individuals least able to pay.
- ***Political.*** Transparency of governance is undermined by restricting citizens from access to and use of public data and information. Rights of freedom of expression are compromised by restrictions on re-dissemination of public information, particularly of factual data.
- ***Socio-economic.*** Numerous economic and social positive externalities—especially through network effects—can be realized on an exponential basis through the open dissemination of data and information on the Internet. Conversely, the commercialization of public data and information on an exclusive basis produces de facto public monopolies that have inherent economic inefficiencies and are contrary to the public interest on other social, ethical, and good governance grounds.

Analysis of Open Access and Cost Recovery Policies

- **Background studies leading to subsequent empirical measurements:**
 - **U.S. NAS (1997), “Bits of Power: Issues in Global Access to Sci Data”**
 - **EU (1998) “Green Paper on Public Sector Information”**
 - **Lopez (1998) “The dissemination of spatial data”**
 - **Dutch Federal Geographic Data Committee (2000) on economic effects of open access policies for spatial data**
 - **Zillman and Freebairn (2000) “Economic Framework for the Provision of Meteorological Services”**
 - **U.S. NAS (2001) on environmental data**
 - **Dutch Ministry of the Interior (2001) “Prosperity effects of different pricing models for PSI”**
 - **Maurer (2001) “Across Two Worlds: Database Protection in the US and Europe” on the European Database Directive**

Literature Review of Empirical Studies

Study Title	Prepared by/for and year
MEPSIR: Measuring European Public Sector Information Resources.	The study was performed by a Team from HELM and Zenc with a group of country researchers (2006)
PIRA International "Commercial Exploitation of Europe's Public Sector Information"	Final Report for the European Commission, Directorate General for the Information Society (2000)
The economic contribution of Ordnance Survey GB	Oxera (1999)
The economic benefit of the BGS	Roger Tym & Partners (2003)
Borders in Cyberspace: Conflicting Public Sector Information Policies and their Economic Impacts	Peter Weiss ,U. S. Department of Commerce NOAA,National Weather Service (2002)
Canadian Geospatial Data Policy Study	Prepared for GeoConnections , Policy Advisory Node by: <i>Garry Sears</i> KPMG Consulting Inc. (2001)
The Power of Information: An independent review by Ed Mayo and Tom Steinberg	This report reflects the views of the external authors and is not a statement of government policy (2007)
The Commercial use of Public Information (CUPI): Economic value and detriment analysis	A report prepared for the Office of Fair Trading by DotEcon Ltd . (2006)
Economic value of current and improved weather forecasts in the U.S. household sector	<i>Prepared for:</i> Office of Policy and Strategic Planning <i>Prepared by:</i> Stratus Consulting Inc. (2002)
Estimating Economic Benefits from NOAA Physical Oceanographic Real-Time System "PORTS®" Information: A Case Study of Tampa Bay	Report prepared for the Tampa Bay Harbor Safety Committee by Dr. Hauke Kite- Powell,the Woods Hole Oceanographic Institute Marine Policy Center (2005)
The Value of Snow and Snow Information Services	Richard M. Adams Laurie L. Houston, Rodney F. Weiher . Report prepared For NOAA's National Oper-ational Hydrological Remote Sensing Center (2004)
Study of the Economic Impact of the Spatial Data Infrastructure in the Region of Catalunya	By the Centre of Land Policy and Valuations of the Universitat Politècnica de Catalunya (2007)
Benefits of the New GPS Civil Signal: The L2C Study	Leveson Consulting, on behalf of the U.S. departments of commerce and transportation (2006)
The EcoGeo Project	Stéphane Roche, PhD. Project Leader
Developing geographic information infrastructures: The role of information policies	By Bastiaan VAN LOENEN (2006)

Learning from other fields & contexts

Study Title	Prepared by/for and year
Economic Value of the Nova Scotia Ocean Sector	Prepared for Govt. of Canada By: Michael Gardner, Robert Fraser and Mike Milloy, Gardner Pinfold Consulting Economists Ltd., James Frost, MariNova Consulting Ltd., Halifax, Nova Scotia (2005)
Economic Framework for Meteorological Service Provision	Don Gunasekera, Bureau of Meteorology, Melbourne, Australia (2002)
Economic impact of open source software on innovation and the competitiveness of the (ICT) sector in the EU	Prepared for the European Commission. Lead contractor: UNU-MERIT, the Netherlands. Prepared by: Rishab Aiyer Ghosh, MERIT (2006)
Estimating the Economic Benefits of Regional Ocean Observing Systems	Prepared for the National Oceanographic Partnership Program, Marine Policy Center Woods Hole Oceanographic Institution , Hauke L. Kite-Powell, Charles S. Colgan. DRAFT (2004)
Economic Contribution of Fair Use and Information Technology Dependent Industries to the U.S. Economy	Prepared for the Computer & Communications Industry Association (CCIA) by Thomas Rogers ,Andrew Szamoszegi, economic consultants with Capital Trade, Incorporated (2007)

Literature Review: Methodologies

Overview of data collection and measurement approaches

Data Sources	Data Collection Methods	Techniques (examples)	Methodological Approaches
<p>Primary: Industry, government, end users</p> <p>Secondary: mainly government proxy data (e.g., GDP, household income, employment, payroll, and exports) and industry reports</p>	<ul style="list-style-type: none"> ▪ Desk research ▪ Web survey ▪ Online questionnaires ▪ Interviews ▪ Self reporting ▪ In-depth case studies ▪ Focus groups ▪ Delphi study or expert opinion 	<ul style="list-style-type: none"> ▪ Estimate of overall PSI market size based on estimates of respondents ▪ Estimate of overall PSI market size based on turnover ▪ International comparisons ▪ Projection, scenario analysis, expert opinion, and team consensus approaches 	<ul style="list-style-type: none"> ▪ Market based approaches ▪ Contingent valuation method ▪ Conjoint analysis ▪ Normative decision-making models ▪ Economy-wide analysis

Current Approaches: Weaknesses and Challenges

Some Weaknesses:

- **Scope of current studies inconsistent and not comparable**
- **Unreliability of estimates to determine values of PSI products**
 - **Studies often overestimate the true value of PSI to the economy by ignoring the substitutes available in the absence of PSI**
- **Lack of longitudinal studies (internally comparable)**
- **Lack of strong theoretical foundation and robust data collection approaches**
- **Insufficient multidisciplinary or multidimensional studies**
- **Insufficient focus on individual re-users (both as economic and social actors)**
- **No focus on network effects or network externalities from online provision of PSI**

Current Approaches: Weaknesses and Challenges (Cont'd)

Some Inherent Challenges:

Data-related difficulties

- **Problems in separating PSI-dependent sectors from rest of information economy**
- **Limited availability and quality of existing information in general**

Heterogeneity of subject matter (many types of PSI)

Substantial costs of comprehensive empirical studies

Lack of political will to learn about weaknesses of PSI policy and practice

Suggestions for Future Directions

1- Working towards a Manual for Data Collection and Analysis of PSI Policies

- Progress in measurement of PSI policies seems to have virtually stalled
- One way forward is to develop a “Manual for Data Collection and Analysis of PSI Policies”
- Would ideally involve statisticians (e.g. EUROSTAT), national accountants (e.g. from the U.S.) and other PSI experts
- Similar model was successfully used by OECD DSTI in co-operation with Eurostat in 1999 to produce a manual on data collection and analysis in the environmental goods and services industry

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

THE ENVIRONMENTAL GOODS & SERVICES INDUSTRY MANUAL FOR DATA COLLECTION AND ANALYSIS

OECD

TABLE OF CONTENTS	
Foreword	3
Chapter I. Objectives and Scope of the Manual	7
1. Objectives	7
2. Objectives and scope	8
3. Possible future extensions	8
Chapter II. General Concepts	9
1. Definition of the environmental industry	9
2. Classification of the environmental industry	10
Chapter III. A System for Data Collection and Analysis	15
1. The general framework	15
2. Estimating methods for data collection and analysis	17
3. Some suggestions	18
Chapter IV. Practical Approaches and Methods for Data Collection and Analysis of the Environmental Industry	27
1. Sample surveys	27
2. Periodic surveys	27
3. Conditions, publications and data availability	28
4. Other methods	28
Chapter V. Remaining Issues, Progress and Approaches	31
1. The overall policy progress	31
2. The environmental goods and services industry	31
3. Environmental goods and services	31
4. Environmental goods	31
Annex 1. Explanatory notes on the Classification of the Environmental Goods and Services Industry	33
A. The Pollution Management Group	33
B. The Chemicals, Technology and Products Group	35
C. The Resource Management Group	35
Annex 2. Environmental Goods, Intermediate Categories with Harmonized Commodity Description and Coding System (HS) Commodity Codes	39
A. Pollution Management Group	39
B. Chemicals, Technology and Products Group	42
C. Resource Management Group	47
Annex 3. Environmental Activities in the North American Industry Classification System (NAICS)	47
Annex 4. Note: Rev. 1 Codes related to the Environment Industry: The Netherlands	48
Annex 5. Distribution of the Environmental Goods and Services Industry by Standard Industrial Classification (SIC)	52
Annex 6. Distribution of the Environment Industry by Standard Industrial Activities: Germany, 1992	53
Annex 7. An Example of a More Detailed Breakdown of the Environment Industry	54
A. Pollution Management Group	54
B. Chemicals, Technology and Products Group	56
C. Resource Management Group	56
Annex 8. OECD/Eurostat Informal Working Group on the Environmental Industry: List of Participants	58
Notes	61
Bibliography	63

Suggestions for Future Directions

- 2- Create a digital repository of PSI-related information—studies/methods/results**
- 3- Promote and conduct more academic-focused research that is informed by well-established theories and methodologies, including greater attention to:**
 - **Role of individual users (not just industry)**
 - **Methodologies for social effects (not just economic)**
 - **Network effects and network externalities (both positive and negative) need new assessment methods**
 - **Role of automated knowledge discovery (extraction and re-use)**
 - **Pilot projects to test different approaches**
 - **Promoting involvement of young scientists**
- 4- Others???**

Further Reading

Additional works on PSI, scientific data access, and public domain issues (all available freely online or from puhlir@nas.edu):

- Bits of Power: Issues in Global Access to Scientific Data (NAS, 1997)*
- The Role of S&T Data and Information in the Public Domain (NAS, 2003)*
- Reichman, J.H. and Paul F. Uhlir, “A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment, 66 Law & Contemporary Problems 315-462 (2003)*
- Paul F. Uhlir, UNESCO Policy Guidelines for the Development and Promotion of Governmental Public Domain Information (2004)*
- Open Access and the Public Domain in Digital Data and Information for Science (NAS, 2004)*
- Strategies for Open Access to and Preservation of Scientific Data in China (NAS, 2006)*
- Uhlir & Schröder, “Open Data for Global Science”, Data Science Journal, CODATA, (2007).*

THANK YOU!