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Beria, Paolo and Ponti, Marco and Laurino, Antonio

DiAP - Politecnico di Milano

April 2010

A PROPOSAL FOR A WORLD DATABASE ON TRANSPORT INFRASTRUCTURE REGULATION

Paolo BERIA (corresponding author), Dipartimento di Architettura e Pianificazione, Politecnico di Milano, Via Bonardi 3, 20133 Milano (Italy), Tel.: (+39)02.2399.5424, E-mail: paolo.beria@polimi.it

Marco PONTI, Dipartimento di Architettura e Pianificazione, Politecnico di Milano

Antonio LAURINO, Dipartimento di Architettura e Pianificazione, Politecnico di Milano

ABSTRACT

The paper presents the structure and the concepts at the basis of a database on world transport infrastructure regulation, to be launched. The database will be built promoting a "soft" survey on the world regulatory practices, to be filled by scholars and experts on a voluntary basis. The goal of the database is to stimulate research on best practices and interaction among regulators, regulated and scholars.

The work is still under construction. The database structure is ready and the survey is already launched, but incomplete. This paper is a preliminary document which provides a detailed description of the aims and of the database structure, in order to circulate the project and collect suggestions from the academic community.

The structure of the paper is as follows. After a presentation of the aims of the work, section 2 provides a literature review on existing databases. Section 3 details the project, describing the characteristics of the survey, the strengths and weaknesses of the approach, the network to be activated. Section 4 is giving more details on the actual structure of the database and of the corresponding survey. Section 5 gives notice of the first results obtained with a preliminary survey and a preliminary review of literature on some selected countries. Conclusions will outline the next steps of the research.

Keywords: transport; regulation; investment; infrastructure; database; survey.

1. A DATABASE ON INFRASTRUCTURE REGULATION

The need for regulation is more and more crucial in all network industries, where significant natural monopoly conditions exist and where the heritage of legal monopolies is still deeply present and governing the sector. In the field of transport the issue is even more complicated, due to the massive occurrence of vertical integration of infrastructure and services, to the consideration of (at least) some transport services as merit wants, to the state intervention still deeper than in other sectors.

The principles at the roots of the theory of market regulation in the transport sector are quite homogeneous, even if there is not only one possible orientation. To the contrary, we see a huge range of different applications in the real world, where the reality is deeply shaped by the history, by the political directions, by the starting point of market penetration against planned services, by the presence of powerful private operators and by many other factors.

We can say that how principles of regulation in transport sector are applied in the world is substantially unknown in a systematic way. Many modal studies provide detailed pictures of the regulation of the developed countries, usually using a comparative and descriptive framework. However, cross modal comparisons are quite difficult due to lack of homogeneity of information in literature. Similarly, how regulation is applied in smaller or developing countries is rather unknown to the scientific community, except for some significant cases.

These premises suggested us to start a project of collecting the most relevant information on regulation around the world, applying the same framework and maintaining comparability, as much as possible, among modes. The scope of this database is limited to the regulation of infrastructures only, leaving the even more complex field of services regulation to further work.

This paper intends to provide an overview of the research program activity aimed at promoting the construction of the database. The database is built on the basis of a "soft" survey on the regulatory frameworks around the world. The goal of the database is to promote a systematic knowledge of the sector and thus to stimulate research on best practices and interaction among regulators, regulated firms and scholars.

The outline of the paper is the following. The following section 2 provides a literature review on existing databases. Section 3 details the project, describing the characteristics of the survey, the strengths and weaknesses of the approach, the network to be activated. Section 4 is giving more details on the actual structure of the database and of the corresponding survey. Section 5 gives notice of the first results obtained with a preliminary survey and a preliminary review of literature on some selected countries. Conclusions will anticipate the next steps of the research.

2. EXISTING DATABASES AND LITERATURE AND THE USE IN THE DATABASE

The wide literature and research papers on regulatory issues can be roughly divided into theoretical contributions, case studies focusing on a single country or mode, policy studies and surveys. Surveys are particularly helpful to provide a common field for research and to

drive more effectively work to the most significant best practices. For a regulator, they can also be useful as the starting point of an harmonisation exercise.

This provisional review, to be completed during the survey activity, focuses on those papers, documents, books, databases and studies that present a survey of regulatory practices in a country or in a geographical area. This review does not intend to be exhaustive, due to the wideness of the topic, but collects the known studies that best fits with our database proposal.

It is worth noticing that some relevant documents (commentaries, historical studies, surveys, reviews) could be in the language of the country and thus not directly and easily accessible to international scholars community. The added value of this database is also to provide the source aside to the pure information.

A number of databases or comparative studies already exist, approaching the problem of regulation in a similar way than ours. It is necessary to transfer as much information already elaborated in the database, in order to avoid duplications. All these studies are descriptive and generally not providing comments or critical policy indications.

OECD collected significant data to produce indicators summarising regulatory provisions in seven sectors, including rail, air passenger transport, and road freight (Conway and Nicoletti, 2006). The database at the basis of this work is available and covers a significant sample of countries and develops since 1975 year by year.

ACCC (2009) describes the regulatory process and practice in 11 states in Asia, Australasia, Europe and North America. The sectors studied include rail, airport and port sector. The description is rich and focused on regulatory aspects only: the institutional structure, how competition is approached, the presence of barriers to entry and exit, the fare system, the access to infrastructures, etc.

Concerning airport sector only, the GAP database is the most systematic project underway (GAP, 2008) including information for a significant sample of European airports, large and medium sized, such as airport ownership, ownership structure, ownership restrictions, level of horizontal separation, type of regulation applied, pricing structure, the way the excess demand is managed, the regulator, etc.

The ESPO (2005) study provides a description of the framework governing port management in 23 European countries, in particular the legislative framework, how investment decisions are pursued, the financing and charging mechanisms.

OECD (2005) discusses the reform of rail sector and presents how 15 significant world countries pursued competition / regulation in the sector. The country based description is more critical than in the other documents quoted. The topics, not homogeneously detailed in the countries sample, are: the organizational structure of the rail industry and its evolutions, the models of competition present, the issues of network access and capacity allocation, vertical separation, traction and rolling stock as entry barriers, the companies actually providing services. The document derives also some conclusions based on country evidence. Some data on rail sector, especially productivity, can also be found in Thomson and Fraser (2005) database on railways.

A different approach is used in papers and studies, aimed at describing the regulatory regimes in more countries or detailing all the regulatory issues of one single country. Both

horizontal studies exist (one sector, many countries) and vertical (one country, all or many sectors). Usually scientific literature (papers, books, etc.) is more detailed and commented than wide-range reviews as the ones listed in previous section. They tend to provide a critical view of the problem, rather than pure schematic information. This kind of literature is then less systematic to be used in building a database, but extremely useful for evidencing the most critical issues, "invisible" in a simplified database structure.

For example, in the airport sector, the French Conseil National des Transports (2007) provides a brief commentary on the property of airports in Europe. Similarly, Forsyth (2002) provides a detailed paper on Australian and New Zealand airport regulation. Gillen and Niemeier (2006) present data concerning airport ownership and regulatory system in European states, including eastern ones.

A collective work including detailed papers on regulatory aspects of some European highway systems is by Ragazzi and Rothengatter (2005).

The literature on rail sector is richer, due to the deep structural changes occurred in the last decade especially in Europe. The main aspects characterizing the European railways, including some facts about regulation can be found in Savy et al. (1999). EIM, CER (2008), to the contrary, focuses only on an overview of rail charging systems in Europe.

A complete and detailed study on European railway liberalization, commenting on actual openness of the system, is Steer Davies Gleave (2006). It is focusing on services, but many information also on infrastructures (mainly network access) can be found. Another broad range study on institution and legislation of European railways (including BG, IS, LI, NO, RO, CH) is by NEA (2005).

In many cases, the information could come by the use of papers referring to the whole regulatory practice of one single country, instead of modal reviews. Usually these documents are more focused on the historical aspects or tend to be critical commentaries.

Where some information was missing, many more documents could be used to describe specific issues. For example, literature can help with the description of the regulation of one sector in one country only, or with a paper describing a case in which an overview of the regulatory framework is given in the introduction. This kind of reference is not quoted here.

3. CHARACTERISTICS OF THE PROJECT

3.1 Steps of the project

A fundamental characteristic of the database is to be independent and collectively built, i.e. is not filled by the research group promoting it. For this reason, the database must be filled by launching a survey. The survey must be built in a way capable to allow the independent collaboration of many and unlinked scholars. The condition of such collaboration is the setting of a common framework.

The research and survey activity is structured into two sub-functions. The "centralised" research activity consist in:

1. building an "empty" database, i.e. a framework, on transport infrastructure regulation and sharing it via web;

2. managing incoming information and publishing them periodically via website;
3. providing a preliminary and demonstrative content to provide an example and initial material to stimulate discussion.

The "decentralised" activities are done voluntarily by every person wishing to contribute to the project and develops in two subsequent phases:

4. fill up the "empty fields", according to one's knowledge and to the modes or topics of one's interest;
5. cross-control the others' contents, and so contributing to the improvement and update of them.

The survey is designed to be:

▪ *Modular*: the work can be done at the same time by unrelated scholars, if the database is organised in independent modules. Data is organised in countries, modes and sub-topics (state of the networks, regulation and regulatory institutions). This not only allows independency, but also allows focusing on few modules only, so that data can be meaningful also before the end of the overall work.

▪ *Simple*: the independent interaction of many unlinked scholars in the work requires a clear statement of required data and straightness of contents. Even if articulate answers would be useful for research, simple but fundamental concepts are preferred.

▪ *Interactive*: both the structure of the database and the way information is collected must guarantee the maximum interactivity, given the simplicity of the approach. Open access web-based forms (GoogleDocs©) are used, due to the simplicity of access. Also, the project website (www.transregulation.org) is used to circulate the provided information and to stimulate cross-control of information by other scholars. The only limit of the approach is that modifications must be done centrally, due to the relative simplicity of the web-tool used.

▪ *Open access* and *free* ("Wikipedia-style"): All contents will be provided for free. Both collaborators and controllers are required to share their knowledge for free. Each scholar/expert can contribute despite his/her origin and integrating or correcting available information. The open structure will allow both independency of contents and clarity of controls. Project costs will be limited and dedicated to the central operations of maintenance and control.

▪ *Easy to update*: modularity and simplicity determine also easiness of updating process, that is in fact continuous and self feeding.

3.2 Strengths and weaknesses

In the proposed scheme of work lay some strengths and some weaknesses. Among strengths one can evidence:

▪ *"Low cost" character of the survey*: apart the coordination activity and the website maintenance, the other activities are done freely by scholars accruing to their previous knowledge.

▪ *Simple for collaborators*: the filling of a web form and, possibly, the submission of relevant documentation via e-mail are the minimal activity required;

- *Stimulating networking*: the cross control activity might stimulate networking among scholars previously unlinked;
- *Up to date*: the database is continuously updated, at no cost;
- *Intrinsically independent*: the proponent group is in charge only of management and organisation activity. Scientific contents are not discussed by promoters, if no corrections come from third part collaborators;
- *No need for critical mass of data*: the modular character makes it meaningful also if few scholars collaborate on a partial topic only.

On the other side, some weaknesses must be pointed out:

- *Ambitious*: the project is ambitious, aiming at providing an independent picture of worldwide transport infrastructure regulation;
- *Necessarily very simplified*: information must be simplified in order to be included in a very general scheme. This can be a positive fact, but obviously the topic is so complex and "the devil is in the details": simplifications can hide some key points. It is important that the provision of source documents and comments integrate the "yes-no" contents;
- *Complex to manage for administrators*: the management of such data is likely to be hard and time-consuming for administrators;
- *Long term project*: significant results will come in medium-long terms, not in a few months as for a concentrated and targeted survey research project.
- *Voluntary activity*: as the collection of data is carried on a voluntary basis, there is the need to push the involvement of the largest possible group of participants. Voluntarity can threaten the success of the data collection.

3.3 The web tool

The tool used to build the forms to be filled is GoogleDocs™. Apart the simplicity, free availability, easiness of sharing, the tool is very interesting because it generates automatically an Excel-like spreadsheet, that can be easily converted into more common formats and thus elaborated.

On the other side, the tool is quite rough and allows to build only very simple forms. For example, it does not allow to build response-sensitive questions. Nevertheless, the questions will be formulated in order to avoid as much as possible this problem.

4. STRUCTURE OF THE DATABASE

The overall database covers the four modes (railroads, highways, ports and airports) and is structured into twelve main sub-databases:

- General and quantitative aspects (x 4 modes);
- Regulatory aspects (x 4 modes);
- Regulatory institutions (x 4 modes).

As already said, the survey refers to the infrastructures only, except some context questions (specified) that refer also to the services and to the demand.

The following table summarises the main contents of the questionnaire (ports are not yet included). The modes are not homogeneous for three reasons: some questions were not included because too detailed for the mode and not strictly relevant (e.g. "Periodical update of regulatory tools" in rail) or because not as significant as for other modes (e.g. "services management model" is not relevant in air and road sector, because vertical integration has never been used, differently from rail sector). Finally, in some cases the same information is condensed in one question only or detailed into different aspects.

1. General aspects	rail	highways	airport	ports
Infrastructure Management Model	✓		✓	…
Services Management Model	✓			…
Description of the concession framework		✓		…
Is project financing used		✓		…
Type of the concession		✓		…
Ownership of the infrastructure		✓		…
Total network length	✓	✓		…
Number of network operators	✓	✓	✓	…
Number of service operators	✓		(in Reg Asp)	…
Types of network operators	✓		✓	…
Duration of the concessions	✓	✓	✓	…
Demand	✓	✓	✓	…
Type of infrastructure access		✓		…

2. Regulatory aspects	rail	highways	airport	ports
Award and renewal mechanism of concessions	✓	✓	✓	…
Regulatory tools used	✓	✓	✓	…
Periodical update of regulatory tools		✓		…
Vertical separation	✓		✓	…
National planning			✓	…
Open access to network	✓			…
Slot allocation mechanism			✓	…
Is the national network geographically divided?	✓	✓		…
Size of concessions		✓		…
Economic/regulatory consideration for network division	✓			…
Yardstick Competition applied?	✓	✓		…
Open access to stations and terminals?	✓			…
Pricing method	✓	✓	✓	…
External costs included in the tariffs?	✓	✓	✓	…
Presence of competition	✓			…

3. Regulatory Institutions	rail	highways	airport	ports
Independency of the Regulator	✓	✓	✓	…
Extent of the Regulator	✓	✓	✓	…
Status of the Regulator	✓	✓	✓	…
Tasks of the Regulator	✓	✓	✓	…
Staffing level of the Regulator	✓	✓	✓	…

The whole survey has been built, as far as possible, using closed questions. Nevertheless, in order to let collaborators express part of the complexity of the issue, some "open comments"

fields have been introduced here and there. Collaborators are also warmly requested to deliver, at the moment of data collection, also a copy (or the link) of the main quoted sources to the database managers in order to make them available to the users and to be shared in the SIG website.

At the end of each form some questions are used to validate the data.

- The release date of the quoted source;
- Year to which data refer;
- A comment on source reliability;

5. FIRST RESULTS

In the preliminary phase, now completed, we worked in parallel in two ways:

- an "in house" questionnaire filling for a sample of non-EU countries;
- the launch of a voluntary, preliminary survey using the web tool.

The goal was to test the completeness and coherence of the database structure, especially to avoid the risk of possible "euro-centrism" in the questions.

5.1 The self-made country sample

The first phase, following the definition of the forms for the database, aimed at testing and adjusting the questionnaire; the main objective has been to stress and correct the main problems and the weaknesses of the approach, like the possible "euro-centrism", and to verify the degree of availability via web and academic journals of the information required in the forms. We performed this search "in-house", without involving any expert from the field.

Highway sector worked as a sample especially for testing the database. We considered five non-EU nations from different geographic and economic areas (Japan, Mexico, Chile, India, South Africa), in order to have a wider view of the different problems faced by regulation.

The collection of the information derived from the analysis of different sources ranging from institutional data (e.g. governmental websites, national agencies reports, etc) to academic documents (papers, presentations, etc). We collected the most up-to-date information and scenarios in the regulatory field for each nation. Each source has been evaluated in order to extract all the possible information for the three forms since one single source could provide more than one answer.

The experience from this preliminary work evidences a significant difference between the typology of information required and practically available mainly via a web research. General information such as the extension of the network, the duration of the concession or the volume of traffic are quite easy to collect via institutional website. On the other hand some difficulties emerge for the issues concerning regulatory aspects and regulatory institutions. In particularly, regulatory information in many cases, are too generic (or, in the case of academic paper, too theoretical) and incomplete. Moreover it is quite difficult to find sources providing an up-to-date overview of the national regulatory framework. Regulatory institutions are rarely present since in many cases regulatory issues are in charge of Ministry or some

other agency which make difficult to understand who is in charge of what. The following figure summarizes the degree of information found for the sample examined.
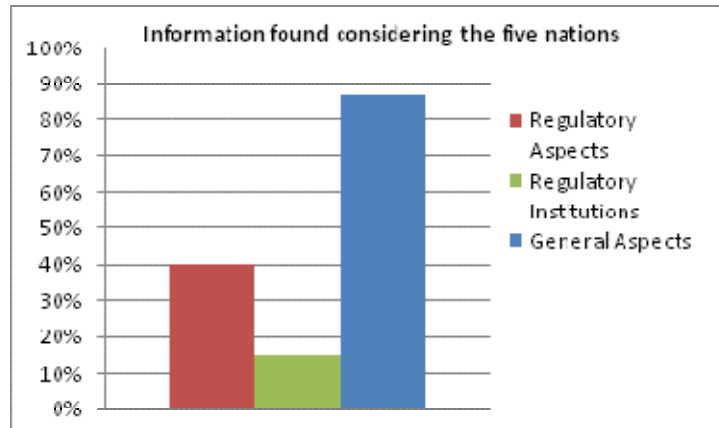

Figure 1

The figure confirms that that of regulatory aspects is the field requiring a major involvement of experts of the sector (regulator, regulated and scholar) in order to conveniently complete the result of a preliminary overview.

Even if out of the scope of this paper, some conclusion of this comparison can be drawn from the preliminary work on few countries; in particular, emerge that India and South Africa are in the early stages of implementing a regulatory system that requires a lot of work in order to define an optimal path towards a credible, transparent a legitimate regulatory system. Chile and Mexico (especially after its disastrous highway privatization in the 80s and 90s, see Engel et al, 2008) are experiencing interesting and successful highway policies mainly thanks to the introduction of new concession models. Finally Japan seems to require a more clear and defined regulatory framework in order to better face the future challenge of the sector. In the next paragraph the first result of the survey will be presented.

5.2 First survey results

After tests, in January 2010 the survey on transport economic regulation has been launched trough the website[1]. After a few months 15 filled forms coming from 7 different countries have been collected thanks to the voluntary involvement of colleagues and experts from the field. The majority of forms received concern the general issues of the three transport modes; the following table summarizes the data collected:

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[1] www.transregulation.org

RAIL SECTOR

NATION	General Aspects	Regulatory Aspects	Regulatory Institutions
BRITAIN	X	X	X
FRANCE	X	...	...
GERMANY	X	X	X
SOUTH AFRICA	X	...	...
SPAIN	X	...	...
...	...	...	...

AIR SECTOR

NATION	General Aspects	Regulatory Aspects	Regulatory Institutions
SPAIN	X	X	X
JORDAN	X	...	...
...	...	...	...

ROAD SECTOR

NATION	General Aspect	Regulatory Aspect	Regulatory Institutions
AUSTRALIA	X	...	X
...	...	...	...

MARITIME SECTOR

NATION	General Aspects	Regulatory Aspects	Regulatory Institutions
	...	...	...
...	...	...	...

Table 1 – Collected forms

The forms have been filled mainly by academic, but there has been an increasing interest in the initiative also from regulators, regulated operators and consultants.

Currently there are approximately 70 members from 21 countries around the world and many more are the contacts of the mailing list (e.g. national agencies, infrastructure operators, regulatory institutions, etc).

The survey activity is a long term commitment aimed at collecting the largest number of forms possibly from the various actors involved in the regulatory process in order to have different viewpoints of the same problems and promote cross control of the contents so as to improve and update the database.

6. CONCLUSIONS AND FURTHER WORK

The survey is exploring a field that looks really little known from a regulatory point of view. This limited knowledge is two-sided: not only there is no systematic picture nor analysis of the regulatory practices going on worldwide on transport infrastructure, but even a more basic information is missing. For example, it is vaguely known how many infrastructures are public or private, are subject to tolling (for railways and highways), are subject to concessions or not, etc. In particular, the information on *real* regulatory practices will be

rather difficult to collect in a meaningful way. A series of relevant issues such as the independency of the regulator, the measurement of efficiency, the evaluation of needed investments etc. require the collaboration of the various stakeholders involved in the regulatory process. Only an iterative (learning by doing) and cross-modal process will reach in due time acceptable and useful results.

The database and the survey are the main activity of a Special Interest Group on Transport Economic Regulation within the World Conference on Transport Research. The SIG activities will include the construction of a network of firms, scholars and public officers really motivated in improving the quality and efficiency of regulatory practices. This is again far from easy, and the term "motivation" has not been used here by chance: regulation means the reduction of "capture" mechanisms, that are *per se* the expression of solid interests, both of the public and the private sphere, while the interests of the users and/or the taxpayers are by definition far less "vocal", and generally more far away in time.

Further work will consist in a more direct approach to data collection for the database, especially concerning the regulatory and qualitative aspects. A number of "scientific visits" will be organized in the main countries of the main continents, in order to build more effective relations and links with the scholars interested, in the first place, but also with some regulatory bodies and some regulated companies.

As far as the data collected and the scientific contributions become more rich and complete, a "Bullettin on transport regulation" have to be planned, together with a gradual extension towards the issue of the regulation of transport services. Some of these services are connected with a specific infrastructure, but some large ones are not, like local public transport.

An obvious, final claim has to be made: this project needs help in first place by the scholar interested due to the relevant and challenging methodological and "political" difficulties entailed by this type of project; finally the increasing involvement of collaborators (regulators, regulated bodies and scholars) that up to now is based only on strictly volunteer contribution, is the only way to gain effective results like the promotion of a better regulation.

ACKNOWLEDGEMENTS

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