

BOOK REVIEW: **Megaprojects and Risk: An Anatomy of Ambition**

Bent Flyvbjerg, Nils Bruzelius and Werner Rothengatter, Cambridge University Press, Cambridge, UK, 2003, 207 pages

BY JOSEPH COATES

This book documents beyond question that those who promote large-scale infrastructure and civil works projects running to billions of dollars, leave "Public and private investors, parliaments, media and the general public.. routinely inadequately informed and misled regarding the risks involved in megaprojects" [1]. Having confirmed what we all know who follow the field, they go into overwhelming and convincing detail about experience in many countries and integrate earlier studies on the subject with their own.

Flyvbjerg, Bruzelius and Rothengatter are, respectively, Professor in the Department of Development and Planning at Aalborg University, Denmark; Associate Professor at Stockholm University and a consultant in transport and planning; and Head of the Institute of Economic Policy Research, University of Karlsruhe, Germany.

The situation is, at core, unchanged in the past 70 years. Their research shows that the situation is similar throughout the industrialized and industrializing nations, from Asia to the Americas. They examined the new Hong Kong airport, the Akashi Kaikyo bridge in Japan, the Sydney harbor tunnel, Thailand's Second Stage Expressway, the Boston "Big Dig," freeways and railways in California, the new Denver international airport, etc. The book is particularly relevant to the futurist community because all megaprojects when completed are around for a long time and are becoming more the fashion in infrastructure construction, and often, if not usually, involve mixes of national and international governments, private and public capital as well as development banks.

Cost overruns are not the only aspect of the problem that they highlight. The failure of economic and social performance after the projects have been built is common. "The Channel tunnel, opened in 1994 at a construction cost of £4.7 billion, is a

case in point, with several near bankruptcies caused by construction cost overruns of 80%, financing costs that are 140% higher than those forecast and revenues less than half of those projected..." [2]. Denver's US\$5 billion new international airport"... was close to 200% in cost overrun and passenger traffic in the opening year was only half of that projected" [3].

The Major Projects Association, an organization of contractors, consultants, banks and others interested in megaproject development, has concluded that "too many projects proceed that should not have [been] done" [4]. Regional development claims for megaprojects are often merely a sop to promote political acceptance, and many of them depend upon "nonmeasurable or insignificant claims."

The authors cite as a core factor, underlying all of these dreadful situations with megaprojects, the lack of transparency in decision making and the weak involvement of the civil society, or what they call a "democracy deficit." They make a big point of the failure to pay attention to risks and the lack of accountability in the project decision-making processes as a main source of difficulties. The authors' concept of risk is almost entirely limited to financial risk.

Most megaprojects involve three features that are systematically ignored or underplayed: uncertainty about facts, high-decision stakes, and values in dispute. Risk assessment, essential to dealing with these factors, is usually absent or inadequate.

In their own work, the authors emphasize three projects: the Channel tunnel, opened in 1994; the Great Belt link, opened in 1997 and 1998, connecting East Denmark with Continental Europe; and the Oresund link between Sweden and Denmark, which opened in the year 2000.

They cite a study out of Aalborg University that looked at 258 projects costing approximately US\$90 billion,

1995 prices. Some of their conclusions are the following:

- In 9 out of 10 transport infrastructure projects, costs are underestimated, resulting in cost overrun;
- For rail, actual costs are, on the average, 45% higher than estimated costs (standard deviation, S.D. = 38);
- For fixed links (tunnels and bridges), actual costs are, on the average, 34% higher than estimated costs (S.D. = 62);
- For roads, actual costs are, on the average, 20% higher than estimated costs (S.D. = 30);
- For all project types, actual costs are, on the average, 28% higher than estimated costs (S.D. = 39);
- Cost underestimation and overrun exist across 20 nations and five continents; it appears to be a global phenomenon;
- Cost underestimation and overrun appear to be more pronounced in developing nations than in North America and Europe (data for rail only);
- Cost underestimation and overrun have not decreased over the past 70 years. No learning seems to take place;
- Cost underestimation and overrun cannot be explained by error and seem to be best explained by strategic misrepresentation, namely, lying, with a view to getting projects started [5].

A snapshot of construction overruns from transportation projects is given in Table 1. One would think that with the worldwide experience in transportation projects, more realistic estimates would be the rule, not the exception.

For the widespread failure in demand, i.e., use of forecasts, they cite seven reasons: inadequate methodology, often involving applying the wrong forecasting tool; poor database; discontinuous behavior and the influence of complementary factors;

unexpected changes of exogenous factors; unexpected political activity or missing realization of complementary policies; implicit appraisal bias of the consultants; and finally, appraisal bias of the project promoters. Their conclusion is: do not trust traffic forecasts, especially for rail [6].

Table 1: Examples of construction cost overruns in large transport projects

Project	Cost Overrun (%)
Boston's artery/tunnel	196
Humber Bridge, UK	175
Boston-Washington-New York rail, USA	130
Great Belt rail tunnel, Denmark	110
A6 Motorway Chapel-en-le-Frith/Whaley Bypass, UK	100
Shinkansen Joetsu rail line, Japan	100
Washington Metro, USA	85
Channel tunnel, UK, France	80
Karlsruhe-Bretten light rail, Germany	80
Oresund access links, Denmark	70
Mexico City metro line	60
Paris-Auber-Nanterre rail line	60
Tyne and Wear metro, UK	55
Great Belt link, Denmark	54
Oresund coast-to-coast link	26

Constant prices; (p. 14 of Ref. [1]).

The authors are equally harsh in their analysis of the failure of environmental impact analysis, citing three generic causes of failure: a lack of accuracy in impact predictions; the narrow scope of impacts and their time horizon; and an inadequate organization scheduling and institutional integration of the environmental impact assessment process into overall decision making [7].

They also have harsh conclusions about the assessment of environmental impacts. "The main obstacles to learning about actual environmental risks are the absence of mandatory, institutionalized requirements for postauditing and the indifference among authorities, developers and the general public to such audits" [8].

A methodological note dealing with financial risk points out that, "The failure to reflect the probabilistic nature of project planning, implementation and operation is a central cause to the poor track record of megaproject performance. . ." [9].

The authors' recommendations sometimes seem so simpleminded that one wonders why they even need to be stated. With regard to strategies for risk assessment, they argue that the most-likely-development (MLD) principle should be substituted for the everything-goes-according-to-plan (EGAP) principle [10].

The conventional approach to megaprojects is outlined in 17 steps [11] and reformulated in 22 steps [12].

Laying out the lessons learned and the proposed remedies for accountability, four instruments are proposed. These are (1) transparency; (2) performance specifications determined by stakeholders; (3) explicit formulation of a regulatory regime and identification and elimination of policy risks

before decisions are taken; and (4) the involvement of risk capital as far as possible [13].

The book ends with extensive end notes, a long bibliography of background material, and studies related to their own.

Unfortunately, they do not give enough attention to four topics. First is the extent to which the government agencies or the legislatures responsible for agreeing and supporting projects actually encourage being misled and receiving outrageously inappropriate economic forecasts. This should include more on the psychology of institutional politics.

Second, not all projects come in over budget. Some come in right on budget and some fewer below the budget as are cited in the text. The authors devote no material at all to the conditions that put them on target, nor do they use those on or underbudget projects to test their own remedies for improved accountability. Perhaps, they should do a supplement since they have all the data, to address this point.

Third, nonfinancial risks are ignored, leaving this reader puzzled about whether they are so few as to be trivial, or the extent to which overruns are caused by them. They do note that safety was a factor in the Channel tunnel overrun.

Fourth is the relationship of the authors' analysis to what some refer to as macroengineering projects, those massive long-term projects likely to call for international approval and funding. Examples are, towing Antarctic icebergs to dry regions, terraforming Venus, rerouting the north flowing rivers of Siberia and three score others proposed in the last 75 years. Some recent concepts are discussed by Schneider [14].

An informative complement to the book under review especially for urban planners and Americans is Altschuler and Luberoff's *MEGA-PROJECTS: The Changing Politics of Urban Public Investment*. They see both continuity and substantial change in big urban infrastructure projects for reasons too numerous and complex to repeat here. Their notes on overruns generally concur with the book under review [15].

Flyvbjerg et al.'s book is unequivocally recommended to anyone who has connections with the plan, design, analysis, funding, appreciation, approval, monitoring or operation of megaprojects.

REFERENCES

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- [2] *Ibid.*, p. 3.
- [3] *Ibid.*, p. 3.
- [4] *Ibid.*, p. 4.
- [5] *Ibid.*, pp. 15-16.
- [6] *Ibid.*, pp. 28-31.
- [7] *Ibid.*, p. 49.
- [8] *Ibid.*, p. 64.
- [9] *Ibid.*, p. 73.
- [10] *Ibid.*, p. 80.
- [11] *Ibid.*, p. 87.
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