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Private Provision of Public Infrastructure: An Organizational Analysis of the Next Privatization Frontier

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Abstract

Constrained by severe, ongoing fiscal pressures and sensitive to concerns over bureaucratic inefficiency, policy-makers in a number of countries are re-evaluating both the goals and instruments of the modern state. In doing so, some have endorsed the need for government 'reinvention,' a term that is admittedly susceptible of a broad range of meanings, but which nonetheless contemplates a significant shift away from reliance on governmental provision of goods and services in favour of provision by the for-profit and third sectors.' Although not uncontroversial, the claim is that, in comparison with governmental supply systems, both for-profit and third sector modes of delivery offer a superior means for organizing productive activity because of the greater incentives that exist within these organizations for lower-cost, innovative production. Although the claim has been made in a number of different policy contexts, we focus on its salience in the context of government's role in supplying traditional physical infrastructure projects such as roads and highways, bridges, dams, water and sewage systems, and airports.

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Ronald J. Daniels
Michael J. Trebilcock*

PRIVATE PROVISION
OF PUBLIC INFRASTRUCTURE:
AN ORGANIZATIONAL ANALYSIS
OF THE NEXT PRIVATIZATION FRONTIER†

I *Introduction*

Constrained by severe, ongoing fiscal pressures and sensitive to concerns over bureaucratic inefficiency, policy-makers in a number of countries are re-evaluating both the goals and instruments of the modern state. In doing so, some have endorsed the need for government 'reinvention,' a term that is admittedly susceptible of a broad range of meanings, but which nonetheless contemplates a significant shift away from reliance on governmental provision of goods and services in favour of provision by the for-profit and third sectors.¹ Although not uncontroversial, the claim is that, in comparison with governmental supply systems, both for-profit and third sector modes of delivery offer a superior means for organizing productive activity because of the greater incentives that exist within these organizations for lower-cost, innovative production. Although the claim has been made in a number of different policy contexts, we focus on its salience in the context of government's role in supplying traditional physical infrastructure projects such as roads and highways, bridges, dams, water and sewage systems, and airports.

Physical infrastructure offers a useful litmus test for evaluating the sundry claims that have been made in favour of government reinvention. First, there is a growing level of concern in both the developed and developing world with the adequacy of existing levels of investment

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1 See David Osborne and Ted Gaebler *Reinventing Government* (New York: Plume 1993); The National Performance Review (*Gore Report on Reinventing Government*) (New York: Random House, Times Books 1993); Michael Trebilcock *The Prospects for Reinventing Government* (Toronto: C.D. Howe Institute 1994).

in infrastructure.² In part, concern over infrastructural investment can be traced to economic studies that have asserted a strong linkage between infrastructure investment and national productivity. Perhaps the leading proponent of this view, David Aschauer, has argued that declining levels of investment in infrastructure accounted for declining productivity growth in the G-7 countries during the 1970s and 1980s.³ Although the magnitude of the purported correlation between infrastructure investment and growth has been questioned in subsequent research, that research has tended to confirm that such a relationship does exist,⁴ and, further, that societal welfare gains could be realized

- 2 The World Bank has recently undertaken an extensive study of infrastructure investment in the developing world: World Bank report *Infrastructure for Development* (New York: Oxford University Press 1994). The report notes that developing countries currently invest \$200 billion a year in new infrastructure, an amount equal to 4% of their national output and a fifth of their total investment, a level which is expected to increase to 7% of total output by the year 2000. While private investment in infrastructure now constitutes only 15% of the total investment, given fiscal pressures, that level is expected to grow in the near future.
- 3 David Aschauer 'Is Public Expenditure Productive?' (1989) 24 *J. of Monetary Econ.* 177; 'Does Public Capital Crowd Out Private Capital?' (1989) 24 *J. of Monetary Econ.* 171; and 'Public Investment and Productivity Growth in the Group of Seven' (1989) 13 *Econ. Perspectives*. Aschauer's results were based on regression analysis on a standard Cobb Douglas aggregate production function which generated predictions of the effect of infrastructure investment on productivity. On the basis of Aschauer's research, it is possible to attribute fully 100% of the productivity slowdown in the United States over the last several decades to declining levels of infrastructure investment. Indeed, Aschauer has claimed that returns to core infrastructure expenditure may be as much as 20 times that of private capital. (David Aschauer 'Why Is Infrastructure Important?' in Alicia Munnell (ed.) 'Is the Public Capital Stock Too Low?' Chicago Fed. Letter, Federal Reserve Bank of Chicago, October 1987, No. 2.) On the basis of this work, Aaron projected that a \$500 billion increase in the 1988 stock of public capital would translate into a productivity gain of 14.0 to 14.8%. (Henry J. Aaron, Discussion of 'Why Is Infrastructure Important?' in Alicia Munnell, supra, 51-63.) Similarly, Robert Reich has invoked Aschauer's work to suggest that a one-time \$10 billion increase in new infrastructure investment would support a permanent \$7 billion increase in US GNP. See Robert Reich 'The Real Economy' (February 1991) 267 *The Atlantic* 35 at 46).
- 4 For instance, invoking cost function analysis, Catherine Morrison has found that 20% of productivity growth in the United States could be attributed to infrastructure investment. (Catherine J. Morrison *A Microeconomic Approach to the Measurement of Economic Performance: Productivity Growth, Capacity Utilization, and Related Performance Indicators* (Springer-Verlag Press 1992); 'Macroeconomic Relationships between Public Spending on Infrastructure and Private Sector Productivity in the U.S.' in J. Mintz (ed.) *Infrastructure and Competitiveness* (Ontario: Queen's University 1995). Specifically, Morrison has concluded that 'the cost-benefits from infrastructure investment at the margin appear positive, significant, and often larger than the

by reallocating public and private investment away from other expenditures towards infrastructure.⁵

A second reason for focusing on physical infrastructure projects relates to the challenges in designing workable institutional arrangements that permit public goals to be vindicated in a setting of enhanced private sector involvement. These issues are particularly acute in physical infrastructure projects where an amalgam of efficiency and distributional goals – public goods, natural monopolies, externalities, coordination problems – have traditionally furnished support for public intervention of some kind. To the extent that these rationales enjoy some continued force, the question is whether and how enhanced levels of private sector or third sector involvement can be reconciled with a role for the state.

A final reason for focusing on physical infrastructure relates to the distinct properties of these projects and the challenges posed for devising optimal institutional arrangements. These properties include: (1) the large, up-front investments required by physical infrastructure projects (given asset lumpiness, investors often cannot make incremental investments, and typically these projects have high minimum-efficient scales); (2) the longevity of infrastructure assets (implying that the life span of the asset will often exceed the term of the project contract, which creates contracting problems discussed below); (3) the sunk investment in such assets (given the location and use-specific nature of these assets, investors will not be able to recover the value of their investment through the redeployment of assets to next-best uses); (4) the anticipatory character of the investment (the final value of physical infrastructure projects is hard to determine *ex ante* because

associated costs even when only manufacturing benefits are taken into account' (in Mintz, *supra*). It should be noted that Aschauer's recent work, which is based on an expanded framework, yields results that are consistent with Morrison's.) Other economists, relying on project-specific cost-benefit analyses, have also demonstrated significant gains from targeted infrastructure investment. For instance, David Lewis argues that fully audited benefit-cost studies of investments in new runways for Minneapolis–St. Paul and Vancouver international airports yield reported rates of return in excess of 100%. (David Lewis 'Infrastructure and Economic Growth' in Mintz, *supra*.) He also cites studies respecting other infrastructure projects that indicate significant benefits from public infrastructure investment: highway maintenance projects (30 to 40%), new highway construction in urban areas (10 to 20%), and modernization and expansion of air traffic control systems (20 to 25%). For a summary of these studies, see World Bank, *supra* note 2, 15.

5 See, for instance, Douglas Holtz-Eakin 'Public Sector Capital and the Productivity Puzzle' National Bureau of Economic Research, Working Paper No. 4122, July 1992.

the services they provide are dependent upon the value of downstream goods and services); and (5) the status of government as a party to infrastructure projects with the private sector and the difficulties in devising effective contractual commitments against ex post opportunism by government.

In this article, we canvass the scope for enhanced private sector involvement in the provision of public infrastructure by focusing on several different projects that have been recently initiated or completed in Canada: airports (Terminal 3 and the aborted redevelopment of Terminals 1 and 2 at Toronto's Pearson International Airport), toll roads (Highway 407 north of Toronto), and bridges (the fixed link between Prince Edward Island and New Brunswick). The structure of these projects is based on an allegedly innovative set of organizational arrangements: the so-called public/private sector partnership. The stated purpose of these projects is to increase the level of private sector participation in designing, building, and operating projects that service public goals.

We develop two central themes in the article. First, while tangible efficiency gains can be realized by remitting responsibility for infrastructure development to the private sector, we argue that these gains can easily be offset by losses that derive from faulty design of both the selection process and the contractual arrangements used for implementation. Second, and greatly complicating matters, are the contracting problems posed by the status of government as a party to the public/private partnership. Because of its inherent powers of legislative fiat, governments can abrogate contractual undertakings without having to compensate parties for the loss of their expectation profits. The existence of this power places understandable limits on the willingness of private sector developers to invest risk capital in these projects, thereby depriving government of at least some of the benefits from private sector involvement. In general, we conclude that insufficient attention to the complexities of the institutional challenges raised by highly integrated public/private sector infrastructure partnerships has led to uncritical enthusiasm for them by many of their proponents. The recent World Bank report *Infrastructure for Development* strikingly exemplifies this tendency: while emphasizing the magnitude of present and prospective investments in infrastructure by developing countries and the potential for a much enlarged role for the private sector in infrastructure development and operation, very little attention is paid to the design of the institutional processes surrounding public/private sector infrastructure partnerships or the complex contracting problems that they present. However, the difference between success and failure of

these projects in terms of the welfare gains over traditional modes of infrastructure development resides in the institutional details that we analyse herein.

II *Three recent Canadian case studies involving public/private partnerships*⁶

A. INTRODUCTION

The public/private sector partnerships in the development and operation of infrastructure that are proliferating around the world vary widely in both scale and nature. According to the World Bank, the average size of such projects in low-income countries has been \$440 million and that of projects in the planning stages has been even higher, at \$640 million. In middle-income countries average project size is more than 25% smaller.⁷ However, even in developed economies, some projects are of very large scale, the best-known being the private financing, construction, and operation of the Channel Tunnel between England and France involving a capital investment of about \$US11 billion.⁸ By contrast, a number of public/private infrastructure partnerships relate to relatively small-scale activities, often at the local or municipal level, such as water and sewage treatment facilities, often entailing capital investments of a few million dollars. The sectors where these partnerships have emerged also vary widely and include telecommunications, power generation, power distribution, gas distribution, railroads, road infrastructure, ports, airport facilities, and water and sewage treatment plants.⁹ The nature of the arrangements involved also varies widely. Some involve public ownership with private operation through lease contracts, concessions, or management contracts, while others involve full private ownership and private operation. Yet others involve non-profit operation through local community organizations.¹⁰

In this part, we briefly discuss the structure and salient features of three recent Canadian case studies involving public/private partnerships in the development and operation of public infrastructure that are the basis of the organizational analysis we develop in this article:

6 A detailed description of the case studies is developed in a draft manuscript on file with the authors.

7 World Bank, *supra* note 2.

8 See Robert Tiong 'Comparative Study of BOT Projects' (1990) 6 *J. of Management in Engineering* 107, 108.

9 World Bank, *supra* note 2, 64.

10 *Ibid.* 8 and 9.

Highway 407; The Prince Edward Island Fixed Link; and the redevelopment of Pearson International Airport in Toronto.

B. HIGHWAY 407

Highway 407 is a 69 km toll highway that is designed to alleviate traffic congestion in the northern region of the Greater Toronto Area at a cost of \$929.8 million.¹¹ Although the provincial ministry of transport was initially committed to developing the project as a non-toll highway through the traditional procurement model, government budget constraints would have dictated the project's completion over a twenty-year period. By structuring the project as a public/private partnership, the government was able to expedite the project's development to four-and-a-half years.¹² Further, by vesting ownership of the highway for a term in the private sector, it can be presumed that government's direct responsibility for the imposition of the tolling charge (a revenue generation device used infrequently in Canada on public highways) would be attenuated.

Responsibility for the selection of a project developer was vested in a Crown corporation, the Ontario Transportation Capital Corporation (OTCC).¹³ The OTCC used a three-stage selection process, involving an initial request for expressions of interest and qualifications, a value engineering exercise,¹⁴ and a closed-bid request for proposals. Three consortia participated in the first round of the selection process, but one consortium was disqualified early on, and only two bidders sub-

11 Employment benefits are estimated at 3,000 jobs in the first year and 20,000 jobs over the life of the construction project. jobsOntario: Capital, news release, 8 April and 11 May 1994.

12 Under the public/private partnership model, the project would take only four-and-a-half years rather than the twenty years necessary under the traditional model. Conversation with L. Brian Swartz, legal counsel, MTO, 1 June 1994.

13 The OTCC was established in 1993 for the purpose of financing and implementing major public transit and highway construction projects, encouraging private sector investment and participation, and focusing on user-pay financing methods. jobsOntario news release, 10 February 1993. The actual nature of the relationship between the OTCC and the provincial government is unclear, and the Crown corporation seems to be an attempt by the Ontario government to shift infrastructure financing off-budget, even though OTCC debt remains a liability of the provincial government. Although the OTCC is structured as a mechanism which dedicates toll revenues to financing highway construction, it also seems to be able to finance construction at least in part by borrowing against the general provincial credit through government guarantees.

14 See discussion in note 48, *infra*.

mitted final bids. While it was initially anticipated that the project would be privately financed, concerns by the remaining bidders with the risks of low traffic volumes led to demands for government financial guarantees. Ultimately, however, the government concluded that the benefits of private sector financing did not outweigh the costs of such guarantees, and the project was financed entirely through an OTCC public debt issue. At the end of the selection process, the OTCC selected Canadian Highways International Corporation to design and build the project. As of June 1996, the operation and maintenance contracts had not yet been executed.

C. THE PRINCE EDWARD ISLAND FIXED LINK

The Prince Edward Island Fixed Link is a federally sponsored project to build a 13.5 km bridge across the Northumberland Strait, which would constitute the first permanent crossing between PEI and the mainland. The fixed link would serve as a substitute for the existing ferry service between the mainland and PEI, which, in accordance with a constitutional obligation, was required to be subsidized by the federal government. The principal avowed benefit of the project was a significant reduction in the time necessary to travel to and from the province, resulting in enhanced local business competitiveness and increased Island tourism.¹⁵ As well, by contracting out the obligation to link the mainland and PEI, the federal government sought to reduce the financial level of its constitutional obligation.

The project was initiated in 1985, when the federal government received several unsolicited private sector proposals for the development of a fixed link between PEI and the mainland. The project was subject to extensive public review for social (particularly environmental) benefits before and after the selection process was commenced.¹⁶

15 The economic value of the reduced travel time is estimated to be \$398.4 million (1993\$) (*A Benefit-Cost Analysis of the Northumberland Strait Crossing Project*, prepared by Gardner Pinfold Consulting Economists Limited, September 1993 at p. 4). The fixed link is also expected to have additional indirect benefits on economic activity in PEI and the Atlantic provinces, since construction of the bridge creates a large, front-end-loaded job creation stimulus in the Atlantic economy, which is currently suffering from a severe decline in the Maritime fishery – perhaps as many as 1,500 direct-hire jobs annually over the life of the project. (William G. Reinhardt 'PEI Bridge Project Essentials' (November 1993) 68 *PWFinancing* 23.)

16 The initial cost-benefit study conducted by PWC (Economic Feasibility Assessment for the Northumberland Strait Crossing, Draft Final Report, July 1987, Fiander-Good Associates Ltd.), which found a net benefit of close to \$500 million (1987\$), has been criticized on methodological grounds (Peter Townley 'The Weakest Link'

Indeed, so intense was public concern with the social impact of the project that nearly six-and-a-half years transpired between the publication of the initial request for expressions of interest and the execution of the contract between Strait Crossing Inc. (SCI)¹⁷ and the federal government.¹⁸

As with Highway 407, the government used a multi-stage selection process, in this case involving an initial request for expressions of interest and qualifications, a request for proposals, and a request for more complete proposals (including a financial plan). Initially, twelve different consortia expressed interest in the project. However, by the final stage of the selection process, only three bidders remained. The winning bidder, SCI, was selected on the basis that, inter alia, it required the lowest level of federal financial assistance to develop the project: \$40.6 million annually for a term of 35 years.¹⁹ The subsidy conferred by the federal government on the project operators graphically underscores the persistence of government risk sharing in these projects.²⁰ Having selected SCI, sixteen months of negotiations were required before the government and the consortium were able to

(July/August 1992) 13(6) *Policy Options* 15; and *A Review of the Benefit-Cost Analysis of the Northumberland Strait Crossing Project*, prepared by Gardner Pinfold Consulting Economists Limited, September 1992). However, a subsequent cost-benefit study conducted by one of the critics found a net benefit of \$263.6 million (1993\$) (Gardner Pinfold, supra note 15; note that this 1993 study was commissioned by Public Works Canada). The main difficulties in the cost-benefit studies were the valuation of travel savings, the treatment of corporate taxes, and the determining of the social opportunity cost of labour.

- 17 SCI is a joint venture owned by four firms: Strait Crossing Inc. of Calgary (15%); Northern Construction Co. (35%); GTMI (Canada) Inc. of Montreal (30%); and Ballast Nedam (20%). Consultation with Strait Crossing office, Charlottetown, 26 August 1994.
- 18 Such searching social review is a necessary complement to whatever private sector certification occurs through the financing process, as the latter is predicated on private, not social, costs and benefits.
- 19 The federal government's obligation to supply \$41.9 million a year in indexed funding to the project developers was then used to support a debt issue of \$661 million by the developers in exchange for rights to the subsidy. After the 35-year period, the government's subsidy would end, and the project developers would be required to recover ongoing maintenance costs entirely from toll revenues.
- 20 In addition, the federal government assumed a number of different exogenous risks related to the project, in some cases agreeing to compensate SCI for costs of delay related to war, earthquakes, nuclear events, government regulation specifically affecting the project, and environmental injunctions.

conclude a contract.²¹ To safeguard SCI's franchise, the contract between the federal government and the developer limited the government's ability to compete with the project by providing ferry service or by constructing an additional bridge or tunnel within 25 km of the fixed link or by any means that would significantly reduce traffic volumes. However, in the light of the monopoly power conferred on the operator by this restriction, the contract imposed limits on permissible increases in bridge tolls by the operator to 75% of CPI.

D. THE REDEVELOPMENT OF PEARSON INTERNATIONAL AIRPORT

The Pearson International Airport project was a staged public/private project designed to redevelop Toronto's congested international airport by securing private sector involvement in the design, construction, and operation of two new terminal facilities. The first, Terminal 3 (T3), involved the construction of a new terminal building, parking garage, and adjacent hotel and office complex, while the second, the redevelopment of Terminals 1 and 2 (T1T2), involved the replacement of the airport's two existing (and somewhat dilapidated) terminals with a single new terminal which would have had 55 gates in total by the year 2000.²² Several reasons were advanced for enlisting private sector involvement in the project, including higher levels of revenue likely to be generated for the federal government by the project (as opposed to a scenario of continued federal government ownership and operation), the need to ensure the timely introduction of new capacity, and the superior organizational efficiency of the private sector.²³ The T3 project was announced in 1986 and was based upon a two-stage selection process: an initial request for expressions of interest and qualifications, and then a second-stage request for proposals. As in other projects, the criteria used to determine success in the first-round tournament for design ideas were fairly broadly defined: Transport Canada merely identified that the objectives of the project were to: provide a 'world-class' terminal in the shortest period of time; provide a financial return

21 The primary factors in this delay were the two environmental challenges pursued in the Federal Court against the minister of public works.

22 According to a 1987 Transport Canada study, Pearson International Airport has a \$4 billion direct economic impact on the economy of Ontario and is directly and indirectly responsible for over 56,000 jobs. Referred to in the Nixon Report, *infra*.

23 According to Transport Canada, the purposes of the Terminal 3 development were to (1) provide a world-class air terminal facility; (2) reduce government investment in airport facilities; (3) increase private sector participation; and (4) provide a financial return to the federal government. See LBPIA—General Distribution, p. 6.

to the Crown; and maintain acceptable levels of safety and security to air travellers in Canada. Requests by the bidders for information with respect to the actual weighting of each of these factors by the project evaluation team were refused. Eight bids were submitted in the design tournament, and, of those, five consortia were qualified to proceed to the second stage. Of these, only four consortia submitted final proposals, and, at the end of June 1987, the federal government awarded the project to Airport Development Corporation (ADC). Within five months, the government was able to execute a contract with ADC for the project based on a 40-year lease (with a 20-year period of renewal) with required annual lease payments that would vary directly with gross revenues and with the time since project completion. Although the project was expected to cost \$350 million, an expansion in capacity to accommodate an expected increase in traffic load of the terminal's principal tenant, Canadian Airlines, increased costs to \$550 million. The project was completed within 32 months of commencement.

Whereas the rapid completion of the T3 project was viewed as a model for public/private partnerships, the T1T2 redevelopment project was much less so. Almost from the outset, the project was embroiled in controversy. The first reason for controversy was based on the federal government's decision, apparently motivated by revenue goals, to depart from its stated policy preference for vesting responsibility for the development of federal airports in local airport authorities – not-for-profit organizations which would be governed by, and accountable to, local interest groups.²⁴ The second principal reason for controversy was the decision to proceed with the project by way of a single-stage selection process rather than the multi-stage selection process that had been used in other projects. Concerns over the process were compounded by the decision to allow only 90 days (later extended to 125 days) for the submission of formal proposals. However, given the long (one-and-a-half-year) period of delay between the time when the government announced its intention to seek private sector participation in the T1T2 project and the call for proposals, the accelerated time

24 The decision to proceed with a private developer was motivated by the desire to ensure the rapid development of the project (specifically with a view to increasing local construction employment) and by infighting among local politicians over the composition of the local airport authority designated for the Greater Toronto Area. It was also alleged by some that patronage considerations affected the decision (see, for instance, Nixon Report at 9). The federal government's preference for the local airport authority concept was set out in *Guiding Principles* (Ottawa: Ministry of Transport 1987) and elaborated upon in *Supplementary Principles for the Creation and Operation of Local Airport Authorities* (Ottawa: Ministry of Transport 1989).

period may not have visited serious hardship on interested bidders. In any event, three bids for the project were ultimately submitted, of which two were deemed to be within the stipulated terms of reference. Of these two, the government awarded the contract to Paxport Inc. However, soon after the contract was awarded, Paxport was required to merge with the losing bidder, Air Terminal Development Group,²⁵ because the former lacked the financial resources to develop the project on its own.²⁶

In August 1993 (eight months after the contract was awarded), a general agreement for the project was concluded between the merged consortium, Pearson Development Corporation (PDC), and the federal government. As in the case of Terminal 3, the arrangement was structured as a long-term lease (57 years) involving sliding-scale lease payments. Similar to the PEI Fixed Link, the contract with the developer limited the government's ability to undertake actions which would directly debase the operator's franchise, by, for instance, permitting an airport to be built within 25 kilometres of the airport if it would reduce passenger volume by more than 1.5 million passengers a year.²⁷ However, the T1T2 contract did stipulate limits on the prices that retail concessionaires and parking lot operators could charge customers²⁸ and provided constraints on the strategic use by occupant airlines of the airport gates to forestall entry by competitors.²⁹ Further, as in other projects we surveyed, in both the T3 and T1T2 airport developments, the federal government agreed to a scaled rental formula that resulted in a de facto sharing of the risks of low gross revenues with the developer/operator.³⁰ These were supplemented in the case of T3 by a \$70 million loan guarantee contingent on low passenger volumes.³¹

25 ATDC was substantially the same consortium that had developed and was operating Terminal 3.

26 Apparently, the federal government failed to consider financing capability when reviewing prospective developers for the project.

27 However, once a stipulated threshold level of passenger volume was exceeded, the constraint would no longer apply.

28 Prices charged could not exceed 115% of the prices charged for comparable goods and services in downtown Toronto.

29 Through 'use them or lose them' requirements.

30 It also consented to the airport developer utilizing a cost-based rental formula in respect of the rental obligations of the retail concessionaires and airlines, which, given the monopoly properties of the airport, can best be understood as an enforced sharing of developer/operator risks with these parties.

31 While such a guarantee was not provided for in the T1T2 project, the government did make an allowance for a maximum \$33 million deferral of rental payments incurred by the developer in the first three years of the project.

Given the intense concern expressed by the press and others during the 1993 fall federal election campaign with the terminal development, Jean Chrétien's newly elected Liberal government requested a review and report of the transaction from Robert Nixon, a prominent Liberal party member and former provincial cabinet minister. His report, completed in a mere 30 days, found that the contract with the consortium was severely flawed and should be cancelled, subject only to minimal levels of compensation (for expenditures made to the date of cancellation) being provided to consortium members.³² On 3 December 1993 the government cancelled the contract. However, issues of compensation for PDC could not be resolved through negotiation, and in April 1994 the government introduced legislation which would permit it to impose a settlement of approximately \$30 million on the developers, but without the attendant procedural safeguards that normally accompany the public power of confiscation.³³ The legislation has not yet been adopted by Parliament because of the determined

32 Nixon concluded that the project 'fell far short of maximizing the public interest' (at 9). The recommendation that the deal be abrogated was based on perceived infirmities in both the selection process and the contracts designed to implement the transaction. In terms of the former, Nixon focused on the fact that the privatization of the terminals contradicted stated government policy in favour of local airport authorities; on the single-stage, abbreviated selection process that led to an enormous advantage to ATDC (which had gained previous experience through its successful participation in the Terminal 3 contract); and on the lack of a financial pre-qualification requirement. Nixon further alleged that the selection process was sullied by patronage – three individuals in the consortium were closely identified with the Progressive Conservative party. The report also alleged a number of substantive shortcomings in the contracts. Among the most serious was the length of the lease term, which Nixon characterized as being 'difficult to fathom' given that 'with an asset as moved by technological change as an airport, the length of this obligation does not serve the public interest' (at 11). In Nixon's view, the rental formula was flawed because future government revenues from the project would be highly dependent on aggressive pricing conducted without appropriate governmental control and at the risk of making the airport uncompetitive with other airports in Canada and the United States (at 11). It is, of course, not self-evident why the private developer would adopt operational policies that would make the project uncompetitive. Finally, Nixon expressed concern with the broadly phrased performance obligations that bound PDC, noting that it would be difficult for the Government of Canada to determine when such obligations are breached. Because the government's remedies for breach are so Draconian (cancellation or seizure and operation), Nixon speculated that the government would be unlikely to exercise such powers (at 12).

33 Bill C-22: An Act respecting certain agreements concerning the redevelopment and operation of Terminals 1 and 2 at Lester B. Pearson International Airport (First Session, Thirty-Fifth Parliament, 42-3 Elizabeth II, 1994).

resistance of the Progressive Conservative-controlled Senate to the measure, fuelled by growing public apprehension regarding the bill and by a judicial determination that the government had breached its contractual obligations.³⁴ The matter was remitted to a special Senate committee on the Pearson Airport agreements for a public inquiry, which divided along partisan lines in its 1995 report.

E. SUMMARY: THE CHARACTERISTICS OF PUBLIC/PRIVATE PARTNERSHIPS
 Following the standard pattern for large-scale infrastructure projects, each of the projects we examined contained several common characteristics. First, each of the projects entailed large, up-front, sunk investments by bidders that were not compensated for by direct ex ante government subsidies (ranging from approximately \$6 million incurred by the bidders who submitted proposals for the Highway 407 project to \$30 million incurred by SCI in developing its bridge proposal³⁵). Second, each of the projects implicated a range of public policy concerns which could not be sidestepped by the decision to develop the project through a public/private partnership. As illustrated by the PEI Fixed Link, concern over the effectiveness and transparency of levers that the state would be able to wield during and after the construction of the project led to heightened public apprehension around the project's merits and resulted in considerable delay. Indeed, review of the contracts concluded between sponsoring governments (or their agents) and the project developers disclosed considerable attention to these public policy concerns. In some cases, specific contractual limitations were placed on the operator's ability to charge monopoly prices for access to the goods and services under consideration. In the T3 airport project the contract went even further, explicitly incorporating by reference federal, provincial, and municipal laws, and making non-compliance with these laws an event of default under the contract. Of course, given developer concerns over sunk, up-front investments in

34 This finding was in the context of a claim made by the consortium against the federal government for unspecified damages but apparently alleging losses, including forgone profits, in excess of \$200 million: *TIT2 Limited Partnership v. Canada* [1995] OJ No. 137, Court File No. 94-CQ53762 (Ontario Court of Justice General Division, per Borins J) (plaintiffs have provided evidence which satisfies me that the defendant committed a breach of the airport contracts on 3 December 1993, at paragraph 4). See also 'Developers Sue Over Loss of Airport Deal' *Globe and Mail*, 17 September 1994.

35 Apparently the bidding costs were fifteen times higher than originally projected by SCI. William G. Reinhardt 'The High Cost of Building Bridges' (November 1993) 68 *PWFinancing* 18, 26.

specific assets, the desire to incorporate sensitivity to broadly defined public policy concerns often was in direct tension with the need to provide credible assurances to the developer/operator (as an inducement to investment) that the franchise value of the undertaking would not be debased *ex post* by direct governmental action. Third, with the exception of the T3 airport project, the process used to award the infrastructure franchise involved multiple stages, typically an initial tournament for design ideas followed by a final competition for the construction and operation contract for those bidders successful in the first stage.³⁶ One notable feature of the selection process used in each of these cases was the small number of bidders who actually progressed to the final stage of the tournament.³⁷ A fourth common characteristic of these projects was the lengthy period of time (ranging from several months in the case of T3 to well over a year in the case of the PEI Fixed Link) between the time of the formal award of the franchise and the actual consummation of the written contract necessary to implement the project, which probably attenuated the impact of the competitive bidding process on the winning bidder's post-selection performance incentives. Fifth, despite the characterization of these projects as being based on the efficiency benefits associated with private sector finance and risk bearing, virtually all of these projects revealed some significant role for the government in this area, ranging from government-backed public financing of the entire project, in the case of Highway 407; to provision of a long-term governmental subsidy that was used to fund the lion's share of the project costs, in the case of the PEI Fixed Link; to revenue-based ground lease payments that rendered government a quasi-residual claimant, in the case of the airport terminals. Sixth, as is true of long-term contractual relationships generally, the contracts executed between sponsoring governments and franchise operators disclosed considerable reliance on elaborately designed adjustment formulas (in respect of pricing and maintenance obligations) and governance structures to deal with problems of contractual incompleteness.

36 Information respecting the structure of these projects was derived principally from an extensive set of interviews conducted over the summer of 1994 with public and private sector experts involved in the projects and from inspection of the various contracts used to implement the projects.

37 In Highway 407, three bidders expressed initial interest, but only two progressed to the final stage of the bidding process; in the PEI Fixed Link, twelve bidders expressed initial interest, but only five progressed to the final stage; in the T3 airport project, eight bidders started out, but only four progressed to the final stage; while in the T1T2 project, only three bidders submitted proposals.

ness.³⁸ Significantly, when governance mechanisms were utilized, the mechanisms were based on standard arbitration models used in the private sector. To the extent that it has been argued by Goldberg and others that the adjustment mechanisms used by public utility commissions to administer regulatory contracts are functionally equivalent to the contractual provisions embedded in long-term public franchise contracts, this claim is thus only partially correct in the context of the contracts we examined.³⁹ In contrast to the public utility model, public franchise contracts reveal only limited opportunity for meaningful levels of transparency or public participation, thereby raising fundamental accountability concerns.

III Analysis of the organizational structure of public/private infrastructure partnerships

A. INTRODUCTION

In order to appreciate the distinctive features of many of the public/private partnerships that have emerged in the infrastructure setting, particularly with respect to larger projects, it is important not to draw too sharp a dichotomy between the respective roles of the public and private sectors. With many publicly owned and operated infrastructure facilities, such as airport terminals, many of the functions have traditionally been contracted out, for example, catering, security services, airplane refuelling, baggage handling, retail concessions, and janitorial services. Moreover, even with respect to the initial construction of these facilities, governments rarely, if ever, build these facilities themselves through public sector employees, but rather tender out the construction through a competitive bidding process against a detailed set of tender specifications that the government has developed either internally or through consulting arrangements with external design specialists,

38 For instance, concerns over asset degradation through chiselling on required maintenance – one of the principal contractual difficulties involving assets having an expected life that exceeds the term of the franchise contract – were dealt with through a number of different mechanisms, including: general exhortatory duties on the developer/operator to maintain assets in an appropriate condition, stipulated expenditures on asset maintenance (expressed as a percentage of annual gross revenues), annual contributions to an asset reserve fund, periodic inspections by third-party monitors, and provision for resolution of disputes over the breadth of this obligation through binding arbitration.

39 Victor Goldberg 'Regulation and Administered Contracts' (1976) *Bell J. of Econ.* 426. See also George Priest 'The Origins of Utility Regulation and the "Theories of Regulation" Debate' (1993) 36 *J.L.E.* 289.

with the winning bidder in turn subcontracting out various aspects of the construction to specialized third parties, often through a competitive bidding process of its own.

The most distinctive feature of many of the larger public/private sector infrastructure partnerships that are now emerging is the integration within a single private sector firm or consortium of all (or most of) the functions of financing, designing, building, operating, and maintaining the facility in question (subject again to further subcontracting out). The bundling of these functions reflects a form of vertical integration on the part of the private sector provider of these services. Because the functions involved are often highly specialized and entail deployment of quite different bodies of complementary expertise and resources, private sector providers are, however, typically not vertically integrated firms in a conventional sense but consortia ('virtual corporations') that are formed to develop and operate a particular infrastructure facility. This arrangement reflects the often relatively *sui generis* requirements of that facility, usually involving as participants engineering and project management firms, construction firms, financial underwriters, and specialized operating firms. While the consortia typically incorporate their joint venture as a corporation for the project in question, they have a higher degree of malleability or transitoriness relative to the conventional firm. The partners often maintain substantially independent activities, although there are clear reputation and learning curve advantages for consortia in preserving some stability of membership where there are opportunities for bidding on similar infrastructure projects in what is rapidly becoming a global market for these services, and in these cases consortia may evolve permanent corporate structures.⁴⁰

In this section of the article, we explore the potential efficiency gains to be made, at least in principle, from extensive integration, or bundling of financing, design, construction, operation, and maintenance functions in a single provider. At the same time we examine a range of institutional problems relating to the design of the bidding process, the contract negotiation process, and contract monitoring and enforcement processes which these new arrangements give rise to and which may substantially attenuate potential efficiency gains from this particular form of privatization of public sector activities. The problems of

40 In the T3 airport project, the principal construction firm, Huang and Danczkay, sold its interests once the terminal was completed, illustrating the fluid nature of these relationships.

creating and preserving a genuinely competitive bidding and rebidding process, the long-term nature of the contracts entailed and hence the difficulties of writing complete contingent claims contracts, the large-scale sunk costs typically involved, and the financial sensitivity of these projects to changes in the governmental policy environment all raise special challenges. We also briefly consider distributional and political considerations that may influence a government's decision to privatize infrastructure services and the form that the privatization arrangements may take. We then analyse the particular problems of credible commitments raised by the central fact that the government is a party to these contractual arrangements.

B. POTENTIAL EFFICIENCY GAINS FROM VERTICALLY INTEGRATED PRIVATE SECTOR INFRASTRUCTURE PROVISION

1. The traditional procurement model

In assessing the potential efficiency gains that may be realized from vertically integrated private sector providers (consortia) of infrastructure services, it is important to be clear as to the comparative reference point against which these arrangements are being evaluated. For major road, bridge, or airport facilities of the kind on which this article focuses, governments traditionally have themselves identified the need for the project, often reflecting pressures for or against particular projects by politically salient constituencies, and sometimes tested more objectively through benefit-cost analysis. Whether the project proceeds or not has been, to an important extent, contingent on the relevant level of government's fiscal capacity at the time (in many countries in recent years increasingly constrained by severe budget deficits) and on the revenue-generating capacity of the project, which in turn in part depends on where it is situated on the public-goods/private-goods continuum in terms of meeting the criteria of rivalry and excludability that distinguish private goods from public goods, and in part on distributional and political considerations that may dictate that the services in question should be provided free or at subsidized rates to some or all user classes, even where efficient user charges for the services in question could be devised. Assuming that a decision is made to proceed with the project, typically government will draw up a set of comprehensive technical specifications for the initial construction of the facility, in part relying on already developed technical standards or manual specifications for the class of facility in question, or, to the extent the facility presents novel features, through project-specific specifications developed by internal technical personnel or outside

specialized consultants such as architectural or engineering firms, or some combination thereof. Once these detailed specifications have been fully developed, government departments or agencies would then typically advertise for tenders for the construction of the facility in a competitive bidding process. In order to qualify as bidders, firms may be required to demonstrate relevant credentials such as financial and technical capacity, and past experience and performance records on similar projects. The contract with the winning bidder will specify completion date, security and penalties for non-completion or other defaults in performance, and provide for a schedule of payments to the construction firm reflecting satisfactory completion of sequential stages of the project as determined either by staff of the government department or agency concerned or by some agreed third-party certification agent. Broadly speaking, contracts could be cost-plus, fixed-price, or incentive contracts.⁴¹ With respect to cost-plus contracts, these provide few incentives for the private sector contractor to minimize construction costs and correspondingly entail greater risk for the public sector, which will attempt to minimize this risk by intensive but costly monitoring of the contractor's costs. Under a fixed-price contract, the contractor's costs will be of no direct concern to the government, so that less intensive monitoring will be required, although monitoring will still be relevant to non-price dimensions of performance. If construction costs are likely to be affected by technological uncertainties, climatic factors, variable input prices, or labour shortages or disputes, these risks, which the contractor will bear, will presumably be reflected in a risk premium embodied in the fixed price negotiated in the contract. Under incentive contracts, these risks may be shared in various ways. Any such risk sharing will involve risk-incentive trade-offs. Incentives on the contractor to minimize costs may be reduced, to the extent that he can control these factors, although the risk premium charged the government for risks over which he has little or no control is likely to be smaller. With respect to government-determined risks or entirely exogenous risks, the government may be the more efficient risk bearer, given its greater capacity to spread the risk. After satisfactory completion of the project, the government may choose to operate the facility entirely itself through government employees; or, depending on the nature of the facility, it may contract out, for limited periods of time, under a competitive bidding process, the performance of various functions.

41 See R. Preston McAfee and John McMillan *Incentives in Government Contracting* (Toronto: University of Toronto Press 1988).

2. *The vertically integrated private sector model*

a) *Project identification.* In comparison with this traditional model of the infrastructure development and operation process, the fully vertically integrated private provision model that is the focus of this article differs in important respects. First, the government may choose to invite private sector firms to identify potential infrastructure projects. For example, the California Department of Transportation (Caltrans) recently issued an open-ended public invitation for private sector firms to propose toll-road projects in California, which the government agency then evaluated.⁴² Complete government detachment from the question of which projects should proceed is often impossible because of right-of-way and eminent domain issues, network externalities, other external impacts, and monopoly pricing concerns. The private sector, in identifying potential infrastructure projects, will of course be driven by a different set of considerations from the public sector in engaging in the same exercise. As noted above, the public sector is likely to respond to a mix of political pressures and may in addition undertake a benefit-cost analysis that weighs all relevant social costs and benefits associated with the project. Private sector proposals will be influenced only by the expected private rate of return on the project, which will disregard political pressures one way or the other, and are likely to also disregard external costs and benefits of the project that would be captured in a comprehensive social benefit-cost analysis. However, with a totally open-ended public sector invitation to the private sector to propose new infrastructure projects, the evaluation process that the public sector will subsequently have to undertake of these proposals will presumably implicate both political considerations and social costs and benefits, so that proposers are likely to attempt to anticipate, and to some extent accommodate, these considerations in their proposals, consistently with realizing an adequate private rate of return on the project. Unless most of the evaluation criteria to be employed by the government are rendered at least partly explicit and transparent, or other indications are provided in the invitation that to some extent define the range of projects in which the government may be inte-

42 See Jose Gomez-Ibanez and John Meyer *Going Private: The International Experience with Transport Privatization* (Washington, DC: Brookings Institution 1993); Ron Hirshhorn 'The Ownership and Organization of Transportation Infrastructure: Roads and Airports' Background Study Prepared for the Royal Commission on National Passenger Transportation: *Directions* (Ottawa: Supply and Services Canada 1992) 18.

rested, proposers are unlikely to invest significant resources, at least in the absence of subsidies, in developing proposals that may prove to be of no interest to the government. In any event, these proposals are likely to be framed at a largely conceptual level, leaving detailed design for the post-project identification stage.

Under the fully vertically integrated private provider model, once a project has been identified, at least at the conceptual level, either by the government itself or by the government in response to private sector proposals, in theory the government would call for integrated bids on the design, construction, operation, and maintenance aspects of the project. Each of these functions needs to be analysed both separately and in relation to the other functions in the bundle.

b) Design. With respect to the design function, the argument by proponents of the privatization of infrastructure provision is that unlike the traditional method of contracting out engaged in by government in the infrastructure context, where comprehensive specifications of project characteristics are provided to private sector parties, the government stands to realize substantial efficiency gains from contracting out the design function and, in effect, stimulating competition for ideas. Implicit in this view is the notion that governments should shift their focus from specifying inputs to specifying some desired outcome, leaving private sector providers with the opportunity of formulating means of realizing that outcome in the most cost-efficient way possible. Under the traditional contracting-out regime, government agencies would typically rely on standardized specifications or bureaucrats would develop design specifications for *sui generis* projects, but with few incentives to maximize service innovations or minimize costs, and disabled by major information asymmetries as to what may or may not be technologically feasible – expertise which is likely to be better known to private sector firms specializing in the technologies in question.⁴³

43 In this respect, the multi-stage structure of the public/private partnership bears striking similarity to the model used by the US federal government for defence procurement. Because of long lag times between the development and production of defence weapons, defence production is characterized by severe demand and cost uncertainties and, as a consequence of required up-front investments in asset-specific research and production, is beset by endemic hold-up problems. One of the principal models used to resolve these difficulties is a multi-stage selection process that involves competition for a procurement contract on the basis of research ideas tendered in the first stage of the selection process. Interestingly, and in contrast to the structure typically used in the public/private partnership infrastructure studies

On the approach advocated by proponents of the vertically integrated model of infrastructure provision, it is critical that the government be able to specify some desired outcome or output against which competing designs can be evaluated. This may be more feasible in some infrastructure projects than others. For example, in designing a bridge or a toll road, the government could stipulate that the bridge or road must be capable of moving a given volume of traffic over given units of time. In other projects, such as designing airport facilities, the policy objective is much less easy to specify, involving the aggregation and reconciliation of many preferences;⁴⁴ in these cases private sector providers will face difficulties in determining what criteria their potential designs will be evaluated against, and government and public sector agents will have difficulty evaluating competing and perhaps sharply different design proposals without well-specified outcome measures, at least if the risk of appearing arbitrary, subjective, or politically motivated (or even corrupt) is to be avoided.⁴⁵ Obviously, the less clearly

we examined, the federal government will subsidize the development of designs in the first stage of the selection process. However, the subsidy covers only a portion of the costs actually incurred by bidders in the qualifying rounds of the project and so, as in the case of the infrastructure projects we examined, the bidders' decision to invest in research and development is based on a private cost-benefit analysis that compares the up-front costs incurred in design development with the probability of winning the project multiplied by its economic value. After the design proposals are submitted, the government will select two (or more) bidders (of the five or so initially qualified to enter the competition) to proceed to the second stage of the competition where a more detailed prototype of the weapon is developed for competition in the third and final stage of the selection process, wherein the winning bidder will then secure from government a cost-reimbursement-based procurement contract to supply the weapons. An excellent overview of the defence procurement process is provided by William P. Rogerson 'Economic Incentives and the Defense Procurement Process' (1994) 8 *J. of Econ. Perspectives* 65.

44 See David Sappington and Joseph Stiglitz 'Privatization, Information and Incentives' (1987) 6 *J. of Policy Analysis & Management* 567, 575.

45 Curtis Taylor ('Digging for Golden Carrots: An Analysis of Research Tournaments' (draft dated October 1993) forthcoming in the AER) argues that the golden carrot tournament solves for both the input monitoring and output specification problems associated with research: 'Competition among researchers trying to win the contest causes expending effort to be incentive compatible. Moreover, the only role of the courts is to ensure that the specified "prize" ... is awarded to one of the contestants at the conclusion of the contest. *It is not even necessary that a court be able to verify the rank order of the final entries since the sponsor typically has little incentive other than to exchange the prize for the innovation it values most.*' Nevertheless, given endemic accountability problems surrounding public officials, the application of this conclusion to competitions involving adjudication by public officials is somewhat problematic.

specified the project selection criteria, the greater the latitude that decision-makers have in selecting projects; hence the greater the vulnerability of the process to investment by bidding firms in socially unproductive influence activities.⁴⁶ As noted earlier, concern over these difficulties was centrally at issue in the Pearson International Airport redevelopment, where, in part, ambiguity in the definition of required outputs buttressed concerns over the potential for patronage.

The government could, of course, unbundle the design function from the other functions in the bundle and hold a separate design competition just for the ideas. Here again, however, the problems of stipulating with sufficient precision the outcome criteria against which competing designs are to be evaluated would arise. Indeed, government traditionally has often contracted out the design function for various public facilities, by hiring architectural or engineering firms to design public buildings or other facilities. In so doing, the government is able to utilize private sector firms with relevant technical expertise and significant investments in reputational capital, which reduce information asymmetries in the design process. However, in stimulating a vigorous competition for design ideas on an unbundled basis where the objective is to generate a detailed design which would then support a public tendering process of the traditional kind with respect to the construction of the facility that is the subject of the winning design, the government is likely to have to offer a large fee to the winning design proponent (given the 'winner takes all' nature of the competition), in order that participants in the design competition will find it rational to invest significant resources in developing a detailed design, given their expected return on this investment. In the context of defence procurement, William Rogerson speculates that public concerns over the magnitude (and scope for manipulation) of the ex post prize necessary to stimulate optimal ex ante investment in research supports a bundled tournament where this premium can be embedded in the production contract, thereby limiting public transparency of the prize.⁴⁷ Often in the past, government has simply approached several architectural or other design firms, depending on the nature of the facility, and sought preliminary ideas, and then committed itself to one designer to develop

46 The problem of influence activities in the context of a multi-stage auction process is briefly alluded to in Paul Milgrom 'Auctions and Bidding: A Primer' (1989) 3 *J. of Econ. Perspectives* 3, 20. For a discussion of influence activities, see Paul Milgrom and John Roberts *Economics, Organization and Management* (Englewood Cliffs, NJ: Prentice-Hall 1992) 192-4.

47 Rogerson, *supra*, 71.

a detailed design. It is not clear that this process generates an optimal supply of the best design ideas, particularly in large infrastructure projects where different features of different design proposals may be attractive and the optimal design may be a combination of features from a number of proposals. In this case, losing bidders have to contemplate the possibility that the government will use some of their design ideas in the ultimate design, but that they will not be compensated at all for these ideas (the problem of appropriability). Thus, in order to attract a significant number of detailed design proposals, only a large expected return reflecting an appropriate risk premium is likely to attract sufficient losing bidders from which to develop a combined set of design specifications. However, even in this case, bidders still face strong incentives to develop proposals that capitalize on their firm-specific advantages in production, even if the design that is ultimately produced is not least cost. In this way, bidders limit the capacity of government to transfer their design innovations to other bidders.⁴⁸

An alternative approach to design production would be to commission the preparation of a number of design proposals, probably on a fixed-fee basis; but now government may face a larger pay-out than under the winner-takes-all approach and, more seriously, would create no incentives (beyond reputation effects) for proponents to invest resources in developing superior rather than inferior design proposals. Information asymmetries may subvert the capacity of government to determine the level of effort expended in design development.

The government faces many of these problems with the vertically integrated infrastructure provision model. That is to say, competing consortia are unlikely to have equal strengths across all the various functions in the bundle, yet the winning bidder must be chosen on the basis of some balance of strengths and weaknesses. Even if a number of the competing bidders have roughly equivalent strengths in the design function, for a large complex facility (such as an airport) it is unlikely to be the case that one consortium's design is superior in all respects to the others. Thus, ideally, the government would wish to combine the best features of the various competing design proposals. However, this

48 In this respect, investment in these firm-specific design features bears analytical similarity to the entrenchment problem related to excessive investment by managers in manager-specific investments so as to limit the gains from displacement. See Andrei Shleifer and Robert W. Vishny 'Management Entrenchment: The Case of Manager-Specific Investments' (1989) 25 *J. of Fin. Econ.* 123.

combination implies significant complications in the bidding and contracting process.⁴⁹ In this respect, the vertically integrated model exhibits obvious tied sales properties. One option is to partly decouple the design competition from the other functions in the bundle by requiring all qualified, vertically integrated consortia first to submit their design proposals, on the assumption that it will still be in their interests subsequently to bid on the winning design (which may be another consortium's design proposal or represent a combination of features of the competing designs). Presumably, the consortium with the winning or predominant design proposal may feel it has informational, technological, or other advantages over rival bidders in bidding on the remaining functions, and thus there is an incentive to prepare the design proposal which commends itself most to the government. Here again, as with an unbundled competition for design ideas, the cost of preparing a detailed design proposal for a large infrastructure project might be very substantial, but unlike an unbundled design competition there may be no direct compensation for the winning design. Moreover, by restricting the design function to consortia capable of bidding on the remaining functions, proposers in the design competition now face serious free-rider problems in that a rival consortium with an inferior design but superior construction and other capabilities may win the integrated bidding competition. These risks are likely to generate significant risk premiums in vertically integrated bids, given both the inherent costs of preparing such comprehensive bids and the appropriability problem with design innovations. They are also, as mentioned above, likely to result in

49 Some of these problems are revealed by the value engineering exercise that was incorporated into the Highway 407 selection process. After the first-stage design tournament, the government sought to pool the best design ideas submitted by each of the bidders into a baseline project description that could then serve as the basis for bidders to make more elaborate proposals in subsequent bidding stages. By increasing the common base of information available to bidders in a common values auction, uncertainty over the underlying value of goods is diminished, which should, in turn, enhance bidder competitiveness. Apart from its effect on competition, the exercise provided the public with an opportunity to express preferences over trade-offs in the design of the project, for example, between safety and cost. Nevertheless, value engineering is not unproblematic; recognizing that a bidder's best ideas will be appropriated for the benefit of all bidders in later-stage bidding over the production contract, consortium members have strong incentives to hold back their best ideas to protect their relative advantages. This effect may, however, be dulled by the fact that if a bidder withholds sound ideas from the first stage of the selection process, its ability to proceed to subsequent bidding stages may be jeopardized.

bidders making socially perverse investments that attempt to limit the ability of other bidders to exploit their design proposals.

An alternative approach to mitigating these problems would be to deal with them at the contracting rather than at the bidding stage of the process. That is to say, bids on all functions – design, construction, financing, operation, and maintenance – could be solicited in a single competition, but the winner of the competition would thereby win the right merely to attempt to negotiate a contract thereafter with the government, in the process of negotiating which the government would be free to introduce design or other features of losing bidders' proposals. The winning bidder would then have to decide whether to accept these proposed changes to its proposal. But again, various problems present themselves. First, suppose the winning bidder does not accept all or any of the changes to its bid proposed by the government. Presumably, in the absence of a concluded contract, the government would be free to withdraw from negotiations and perhaps reapproach one of the other bidders. Or the government may behave more strategically and play the winning bidder off against other bidders in the contract negotiations. Alternatively, the winning bidder could accept all or most of the changes proposed by the government and modify its bid, but losing bidders will not unreasonably complain that they should have been given a similar opportunity to modify their bids in the light of what is really a rolling or evolving set of contract specifications ('a moving target'). Moreover, once a government agency has pre-committed to a particular bidder before negotiating the detailed contract, competitive pricing discipline is likely to be attenuated.⁵⁰ Thus, extracting from private sector firms in the competitive bidding process an optimal supply of innovative design ideas without attenuating competitive pricing discipline presents serious difficulties.

Beyond eliciting an optimal supply of ideas, the arguments for bundling the design function with other functions have some force. Under more traditional modes of developing infrastructure projects (and indeed building other facilities), it has been a common complaint that separating the design function (and personnel) from the construc-

50 Once the government has publicly announced its selection of a winning bidder, it is subject to political embarrassment if it is forced to reopen the bidding process in the event that it is unable to come to terms with that consortium, especially in a setting where concerns over project timeliness explain government's decision to opt for the public/private partnership in the first place. Concern over these political costs creates undesirable lock-in effects which tip the post-selection balance of bargaining power in favour of the winning consortium.

tion function (and personnel) in different teams (hiring an architect to undertake the design of a building while contracting out its construction to another firm, for instance) increases the risk that the designer will be insensitive to 'constructability' problems presented by his design. Given that 80% of the costs of many large-scale construction projects are estimated to be determined by the design, dissonances between the design and construction teams may prove very costly,⁵¹ although again it is not entirely clear why reputational markets for professional firms would not minimize these problems. In the vertically integrated infrastructure provision model, the design and construction teams form part of a larger team that is organized by the consortium undertaking the project, the premise being that the consortium is able to reduce coordination problems through internalizing these functions at lower cost than the public sector where it contracts out these functions separately. However, given that design and construction expertise are likely to reside in different groups of personnel and probably in different firms that are partners in the consortium, at most the coordination problems are minimized but not eliminated through this form of cooperation – presumably by more regular contact between the design and construction teams, by developing design and construction plans simultaneously and interactively rather than sequentially, and perhaps by repeat dealings between the two teams on different projects.

c) Financing, design, and construction. The construction function on large public facilities has almost invariably been contracted out to the private sector, and so the vertically integrated infrastructure provision model represents no change in this respect. However, it does affect various interdependencies between the financing, design, and construction functions by changing incentives in important ways. Most of these relate to how the project is to be financed and operated. If the private sector provider is itself to finance the construction of the facility and to recoup this investment and a return thereon out of subsequent user fees generated from operating the facility, the government has no direct concerns with the initial capital costs, provided that the design which the private sector provider has committed itself to, which will obviously reflect expected revenue constraints, is acceptable to the government. Alternatively, where the project is not to be financed at all or in its entirety from user fees, but wholly or in part from government

51 See Issaka Ndekugri and Adrian Turner 'Building Procurement by Design and Build Approach' (1994) 120 *J. of Construction Engineering and Management* 243.

subsidies, then the government, by stipulating a maximum size of subsidy, will create similar constraints on feasible design and construction options. In contrast, the government is vulnerable to opportunistic behaviour in this context from the private sector provider given the 'essential' nature of many infrastructure facilities and the likely political inability of a government simply to let such a facility fail, with the attendant disruption, pending government assuming full control of the facility or identifying another private sector operator. The private sector operator may well gamble that, notwithstanding an extravagant or misconceived design or excessive construction costs, it can coerce the government into relaxing constraints on user fees so as to permit monopoly pricing, or to raise the level of maximum committed subsidies. Thus, both the design and construction functions are highly sensitive to incentives created by the nature of the financing function.

The nature of these cross-function incentive effects (interdependencies) are key to understanding what superficially may appear to be one of the major mysteries of private sector financing of infrastructure projects. In most cases, private sector financing will carry a higher cost of capital than government financing, simply because the default risk on sovereign debt (given that governments have access to the entire taxpayer base) is obviously lower than for a private sector infrastructure provider, where the cost of capital will reflect both project-specific risks and its *de jure* or *de facto* limited liability. Thus, if the financing function were viewed in isolation from the other functions, given the lower cost of sovereign debt relative to private sector debt, we should see governments financing all activities in the economy. The fact that they finance very few of these activities, at least in a market economy, requires an explanation. In the present context, the explanation appears to lie in the fact that while the cost of capital to the private sector infrastructure provider will be higher than the cost of an equivalent amount of capital to the government (which has the same access to private capital markets), offsetting efficiency gains from the other functions performed by the private sector provider are influenced positively by virtue of the fact that it is bearing the financial risk on the project. However, this trade-off in turn depends upon how the capital investment is to be recouped. If the investment must be recouped from competitively determined revenues from the project, then this will create socially appropriate incentives with respect to the design, construction, operation, and maintenance of projects. While it may be true that governments and private sector infrastructure developers borrow capital from the same sources, lenders' incentives with respect to private sector project financing are sharply different. With the

government as borrower, lenders can ignore project-specific returns, given that lenders ultimately have access to the government's entire tax and asset base. With project financing, project returns become central; lenders are likely to screen development consortia more carefully before lending, to insist on adequate security and financial penalties against non-completion or default, and to monitor performance more closely through the inclusion of numerous, tailored covenants than they would if they were lending to government which in turn then financed the project, thus significantly improving the performance of the infrastructure provider.⁵²

However, with respect to most forms of infrastructure, the infrastructure operator is likely to possess some measure of market power and thus, in the absence of contractual restriction or regulation, may be able to charge monopolistic user fees. Given that even a monopolist has some incentive to maximize profits by minimizing costs, it is not obvious that this will change its calculus with respect to design, construction, operation, and maintenance costs or lenders' monitoring of these functions. However, if user fees are restricted or regulated by the government to prevent monopoly pricing, through some form of rate-of-return regulation, this may create incentives for the private sector provider to overcapitalize the project in order to expand the rate base or to exert weak controls over operating costs, given the cost-plus nature of this form of regulation.

Another argument that is sometimes made for private sector financing of infrastructure projects, notwithstanding the higher cost of private sector capital, is that this serves an economic certification or verification function, and that projects will only proceed that have a positive net present value to the provider, whereas the public sector in selecting projects will not necessarily feel so constrained. This argument has only qualified force. Obviously, a private sector provider, in making his calculus, will be influenced only by private costs and benefits. Where monopolistic setting of user charges is possible, a project may have a positive net value to him even though its social value may be negative, once the dead-weight social losses are taken into account. In contrast, if user charges were to be constrained by regulation to marginal cost (ideally marginal social costs, including congestion and environmental externalities), given the high ratio of fixed to variable costs entailed in

52 See Ronald Daniels and George Triantis 'The Role of Debt in American Corporate Governance' (Summer 1995) *U. of Calif. LR*; William Pearson, President, Agra Engineering Group, Toronto, interview with the authors 1 September 1994.

many infrastructure projects, revenues are unlikely to cover the costs of the project and to generate a positive net present value. A more complicated scheme of regulated prices, such as Ramsey prices, would permit price discrimination where prices are inversely related to elasticity of demand so that the marginal consumer is served, but average total costs are covered by charging inelastic demanders more than marginal costs. Thus, a private sector provider's judgement on the financial viability of a project is a useful check or discipline on a government's decision to proceed with such a project only if these pricing issues are clearly and appropriately resolved at the outset. Given that the government, albeit through negotiations with the private sector provider, will determine and administer these contractual or regulatory constraints on pricing, this to an important extent endogenizes government policy considerations in the private sector provider's calculus as to the economic viability of the project, and undermines this judgment as an independent second check on the social desirability of the project. Where a project is not to be financed entirely out of user fees, but partly or entirely from government operating subsidies, a private sector provider's judgment as to the financial viability of the project again is not an exogenous check on the government's decision to proceed with it, given that the government's decision over the nature and scale of the subsidies is endogenous to the private provider's calculus.

Apart from the necessary relationship between the viability of the initial capital investment and subsequent options with respect to the pricing of services or the nature and size of government operating subsidies, a private sector provider's judgement about the financial viability of a project will reflect only *private* expected costs and benefits and not expected social costs and benefits. With many large infrastructure projects, there are likely to be significant positive and negative externalities, which will not be reflected in this private calculus, but which government agencies overseeing the project may wish to consider in judging the social viability of the project or in containing or compensating for these externalities through other policies. A private sector firm's willingness to privately finance an infrastructure project may reflect a disregard for negative externalities. Conversely, an unwillingness to privately finance such a project may simply reflect an inability to capture or charge for the benefits of positive externalities. In both cases the private financing decision may not be congruent with a social welfare calculus.

d) Operation and maintenance. With respect to the operating function, this could, like prior functions, be unbundled and contracted out

discretely. Indeed, this is sometimes done with infrastructure. Presumably in this case, the government could simply enter into a management contract for a fixed term, probably accompanied by a lease of existing facilities for the same term, to a private sector provider chosen through a competitive tendering process in very much the way that Demsetz has argued is feasible in creating competition for natural monopoly markets.⁵³ Several well-known problems present themselves with this option.⁵⁴ First, if the infrastructure facility has monopoly features to it entailing some degree of market power on the part of the operator, the government faces a choice between, on the one hand, maximizing the sale price of the franchise by allowing the operator to charge monopoly prices to users or, on the other hand, soliciting bids not on the basis of the highest franchise price but the lowest contractually permitted set of user prices. Presumably the latter is the social ideal, in that it avoids the dead-weight losses associated with monopoly pricing, although it imposes a much more substantial burden on the public sector in reviewing and approving initial bids and monitoring adherence to price commitments thereafter and may have less attractive political properties than maximizing the franchise price.

Under either form of competitive bidding, the winning bidder presumably has similar incentives to minimize costs over the period of the operating contract in order to maximize net profits. However, a major divergence between a private and social calculus in this respect relates to maintenance costs. Where the assets are long-lived, but the operating contract is of shorter duration, there are obvious incentives for the operator to skimp on maintenance or improvement costs where these will have little or no impact on the revenue stream until the post-contract period. This problem could, of course, be solved by making the initial operating contract the same length as the expected life of the assets, thus fully internalizing both the costs and benefits of expenditures on maintenance, although not necessarily capital improvements, replacements, or facility expansion where returns can only be realized thereon beyond the term of the contract. In many cases involving large-scale infrastructure, this internalization function may entail initial contracts of 50 or 60 years. Another advantage of integrating the design, construction, financing, and operating functions in these cases

53 Harold Demsetz 'Why Regulate Utilities?' (1968) 11 *J. of Law & Econ.* 55.

54 For a review of these problems, see Keith Crocker and Scott Masters 'Regulation and Administered Contracts Revisited: Lessons from Transaction-Cost Economics for Public Utility Regulation' *J. of Econ.* (forthcoming).

is that the private provider will have an incentive to minimize the life-cycle costs of the project. Where initial capital investments and ongoing maintenance are substitutes for one another, less initial capital investment results in higher subsequent maintenance and conversely. The optimal mix of the two functions is more likely to be selected by an integrated provider. However, technological uncertainties, uncertainties relating to market demand, and uncertainties relating to the durability or stability of surrounding government policies that may affect the costs or revenues generated by the project make these long-term contracts a much riskier proposition from the perspective of a private sector operator. In turn, the government will have committed itself for the life of the assets to a single operator, notwithstanding the possible subsequent emergence of superior operators. While the government may attempt, in a long-term operating contract, to specify all performance obligations of the operator, over a long-term contract these are very difficult to specify completely *ex ante* and in any event are likely to entail intensive and costly monitoring. Short-term contracts reduce some of these problems (the difficulty of anticipating all future contingencies) while exacerbating others (the incentive to degrade the assets, for example). Moreover, while there is at least the potential for periodic competitive retendering of the contract, as Williamson has pointed out, asset specificity – in this case, specialized human capital relating to the operation of a facility – may create considerable advantages for the incumbent at contract renewal junctures, and militate against the preservation of a competitive contracting environment.⁵⁵

More generally, the case for vertical integration of operation and maintenance with design, construction, and financing functions in the provision of infrastructure is that firms can coordinate these functions at lower cost than can the government; that the cross-function incentive effects of bundling functions (interdependencies) yield superior performance to more discrete forms of contracting out, that is, that decisions affecting the design and construction functions will be influenced by operating obligations, all of which will be affected by financing obligations; and that economies of scale and scope can be realized through integration. The empirical evidence tends to suggest that indeed vertically integrated private providers of infrastructure services can complete initial infrastructure construction much more

55 Oliver Williamson *The Economic Institutions of Capitalism* (New York: Free Press 1985) chapter 13 ('Franchise Bidding for Natural Monopoly'); see also Crocker and Masters, *supra*.

quickly than can be done under the traditional mode of public provision with discrete contracting out of particular functions, in large part because of reductions in transaction and coordination costs through a more simultaneous and less sequential construction process and greater freedom from stringent government budget allocation and procurement regulations.⁵⁶ Yet, the value of this benefit should not be overstated; for instance, in the Highway 407 project, it was alleged that use of the public/private partnership model enabled the government to reduce the time necessary to complete the project from a projected 20 years through traditional procurement to 4.5 years. However, the principal factor behind the shortened construction period appears not to be any design or production efficiency but the government's decision to use off-budget financing to increase the funding for the project from the original on-budget allocation.

One important offsetting feature of vertical integration is likely to be a marked reduction in competition for infrastructure contracts, relative to more discrete or disaggregated contracting-out policies. Economies of both scale and scope are likely to be such that in bidding on large integrated infrastructure projects very few firms or consortia are likely to be able to assemble all the relevant specialized inputs.⁵⁷ These problems are, of course, exacerbated when sponsoring governments impose domestic content restrictions on prospective bidders. Thus, one would predict a very small number of bidders on many of these contracts. In contrast, by contracting out the various functions involved in providing and operating infrastructure in a discrete or disaggregated form, it seems likely that the competitive bidding process with respect to each function is likely to attract significantly more bidders and to be correspondingly more vigorous. Empirical evidence with respect to government procurement generally suggests that increasing the number of bidders from three to four can result in savings of up to 18%; from seven to eight, up to 4%; and from ten to eleven, up to 2%.⁵⁸ The World Bank's *Infrastructure for Development* report, in relation to what have hitherto been treated as natural monopolies (electricity and telecommunications, for example), argues strongly for unbundling these activities, vertically in the case of electricity by unbundling generation from transmission and distribution, and horizontally in the case of telecommunications by unbundling local from long-distance

56 Ndekugri and Turner, *supra* note 51, 250.

57 See Sappington and Stiglitz, *supra* note 44, 571, 572.

58 McAfee and McMillan, *supra* note 41, 151.

service and cellular or radio paging services, in order to stimulate greater competition.⁵⁹ While full vertical integration of the provision of major infrastructure facilities, which the World Bank appears to favour in other cases, may offer offsetting economic advantages, it may well entail highly attenuated competition at the bidding stage of the process (and even less at recontracting intervals), as well as monopoly provision of all services provided through the facility thereafter by the winning bidder or parties to whom it in turn has granted exclusive or monopoly sub-franchises. Nevertheless, if the production of new design ideas can impact materially on the final value of a proposed project, if the nature of those ideas cannot be easily specified in advance, and if explicit prizes for innovative designs cannot be awarded without attracting political controversy, then restrictions on the number of entrants competing in the selection process (by, for instance, insisting on bundled services) increase the value of the expected premium, and elicit increased research effort.⁶⁰

C. DISTRIBUTIONAL AND POLITICAL CONSIDERATIONS

Distributional considerations arising from the privatization of infrastructure services are likely to vary widely, depending upon the nature of the service in question. Where the services have previously entailed substantial cross-subsidies under public provision, for example to rural or low-income users, these are likely to disappear under an unconstrained, fully vertically integrated private provision model,⁶¹ and thus will provoke resistance to the adoption of this model. Indeed, under such a model adverse distributional effects may be exacerbated if the elasticity of demand by these groups is low, reflecting the absence of choices, thus permitting monopoly pricing or price discrimination. The private sector provider may, of course, be required to maintain these cross-subsidies through ongoing contractual or regulatory constraints. However, these constraints are likely to make it less attractive for private sector operators to invest in such projects and, even where investment is feasible, will entail the government in complex, ongoing contractual or regulatory oversight. The empirical evidence suggests that at some

59 World Bank, *supra* note 2, 53, 54.

60 Curtis Taylor, *supra* note 45: 'Because equilibrium research effort by each firm increases with the size of the prize and decreases with the number of contestants, there is a one-to-one correspondence between choosing the optimal prize and entry fee and choosing the optimal number of contestants and equilibrium effort level.'

61 See John Vickers and George Yarrow 'Economic Perspectives on Privatization' (1991) 5 *J. of Econ. Perspectives* 111, 114.

point detailed regulatory oversight of a private utility or other infrastructure facility operator is likely to yield performance characteristics not sharply different from those of a public enterprise.⁶² Thus, privatization may offer few advantages where the government is committed to maintaining existing subsidy policies (other than through direct transfers).

Other constituencies whose interests may be jeopardized by privatization of infrastructure services are members of public sector labour unions who have been employed in the operation of existing infrastructure facilities that are to be privatized. After privatization, they may face lay-offs, lower remuneration, less job security, and more flexible or more demanding job assignments.

Other constituencies that may be at risk from privatization are both commercial and retail customers, who face the risk of monopolistic pricing of user charges by the private sector service provider if not otherwise constrained either in the initial contract between the government and the provider or by ongoing regulation. Given the essential nature of many infrastructure services, demand for these services is often inelastic and is likely to support a significant degree of monopoly pricing.

Still another constituency that may perceive itself as prejudiced by the privatization of infrastructure services is environmental and related groups who may see private sector developers and operators of certain kind of infrastructure facilities, for example toll roads or airports, as being more likely than public sector providers to discount environmental and related negative externalities.⁶³

A more general and amorphous constituency that may be opposed to the privatization of existing infrastructure facilities accompanied by the imposition of user charges are present users who perceive themselves as having already paid for the facility through various kinds of taxes and are unlikely to be impressed by arguments as to the efficiency of the price mechanism in rationing access to scarce or over-utilized resources.

All of these constituencies are likely to translate the distributional and other impacts that they are likely to bear from privatization into political resistance to the process. With a number of these constituencies (labour or users) the resistance is likely to be less in the case of the privatization of new infrastructure facilities than with existing infrastructure facilities. This is particularly likely to be the case where the govern-

62 Hirshhorn, *supra* note 42, 13, 21.

63 Gomez-Ibanez and Meyer, *supra* note 42, 205.

ment is able to persuade voters and interest groups that the facilities are unlikely to be built at all in the absence of privatization. However, the opportunities for profitable private development and operation of new infrastructure (highways, for example), especially in developed economies where most essential infrastructure already exists, may be very limited.⁶⁴ As well, development of new infrastructure facilities is likely to exacerbate the concerns of environmental and similar groups, relative to the privatization of existing facilities, given the incremental negative environmental impacts or at least 'Nimby' effects that additions to infrastructure are likely in many cases to generate.

On the other hand, privatization of infrastructure services offers some political attractions to government. The most prominent attraction is that it enables governments in a period of budget deficits and an environment of fiscal restraint in many countries to move major capital expenditures on new infrastructure off-budget or to capitalize existing infrastructure by sell-offs to the private sector. However, two important caveats are warranted in this context. First, as noted above, governments, even severely overcommitted governments, can typically borrow more cheaply than the private sector, so that from a social perspective, the case for privatizing infrastructure provision, including the financing function, necessarily turns on the various efficiency and incentive effects, described above, that flow from integrating the financing function with other functions to be performed by the private sector service provider. The second caveat is that the public sector technically is as capable as the private sector of imposing user charges for its services. Thus, if investment in an infrastructure project has a positive net present value, taking into account the revenues that it will generate, the net long-term worth of the public sector may not be enhanced, and could conceivably be reduced, by full privatization of an infrastructure facility.⁶⁵ Unfortunately, because of the manner in which public accounts are maintained by governments in many countries (cash rather than accrual accounting), moving the initial capital investment off-budget or capitalizing existing infrastructure, while not simultaneously reporting forgone future revenues, encourages a form of fiscal illusion which may fool some taxpayers and citizens concerned with the size of the current budget deficit.⁶⁶

64 Hirshhorn, *supra* note 42, 1.

65 See Oliver Williamson 'Credible Commitments: Using Hostages to Support Exchange' (1983) 73 *Am. Econ. Rev.* 519.

66 See Jack Mintz and Ross Preston (eds) *Capital Budgeting in the Public Sector* (Kingston, Ont.: John Deutsch Institute for Study of Economic Policy 1993).

Another political attraction of privatization of infrastructure services is that it enables 'hands tying' or credible commitments with respect to a range of policy-related risks that relate to both the financial viability and in some cases social benefits of a project.⁶⁷ For example, the World Bank reports that failure to maintain existing basic infrastructure in many developing countries has proved a more costly policy shortcoming than failure to invest in new infrastructure, at least in terms of the return on the investments involved.⁶⁸ This shortcoming seems largely explained by the inability of governments to commit resources, on a long-term basis, to infrastructure maintenance in the face of more pressing day-to-day political or other demands on public resources. By privatizing, on a vertically integrated basis, the provision of infrastructure, an ongoing commitment to maintenance of the assets (subject to the difficulties noted above) can be built into the arrangement. Similarly, pricing and subsidy policies can be rendered more stable and predictable by embodying them in contractual commitments between the government and private sector providers, and thus made more resistant to the whims of the political process.⁶⁹ On the one hand, without strong *ex ante* commitments in these areas, private sector providers, having incurred large sunk costs in the initial capital investment, are vulnerable to opportunistic behaviour by government in changing the rules of the game *ex post*, which will increase risk premiums demanded *ex ante* or at the limit discourage more risk-averse firms from bidding at all.⁷⁰ On the other hand, in order to protect or enhance the private sector provider's revenue stream, the government may be tempted to make anti-competitive commitments which may enhance the government's return on the contract, for example, a commitment not to build other competitive facilities, or to permit monopoly pricing of user charges, or to relax environmental constraints, where in each case social welfare may be impaired. But the government, by distancing itself from service provision and tying its hands, short of legislating cancellation or modification of the contract and arguably risking claims for compensation, can deflect some of the political costs that it might otherwise have to confront if it pursued these policies itself as a public operator.

67 World Bank, *supra* note 2, 27, 29.

68 *Ibid.*

69 See Pablo Spiller 'Institutions and Regulatory Commitment in Utilities Privatization' (1993) 2 *Industrial & Corporate Change* 387.

70 Vickers and Yarrow, *supra* note 61, 114; Sappington and Stiglitz, *supra* note 44, 574 and 580.

Another political advantage of privatizing infrastructure provision in a period of fiscal constraint is that it permits employment creation in depressed labour markets without committing additional public resources to this objective (albeit again something of a fiscal illusion if the government is forgoing subsequent revenues from the facility). The empirical evidence suggests, as noted above, that fully vertically integrated private infrastructure providers can complete major infrastructure projects much more quickly than public provision under the traditional disaggregated form of contracting out. Thus, under privatization, jobs in the initial construction phase of the facility can be created more quickly than under public provision. Whether all of these jobs should be counted as net increments to the labour force may again be largely a fiscal illusion. Given that private sector infrastructure providers simply draw on existing sources of domestic and international capital and do not in themselves expand the pool of savings and capital in the economy, it should probably be assumed that most of these projects involve diverting capital from one activity to another where the expected private return is higher.⁷¹ In terms of job creation effects, the net effect, while more concentrated and visible, may be quite ambiguous.

A final argument for privatization of infrastructure services is an infant-industry argument. By governments privatizing the provision of such services to domestic private providers or consortia, the development of the necessary qualities of specialized expertise and the resolution or minimization of coordination problems in large multidisciplinary teams can be advanced by a process of learning-by-doing. Given the size of the global market for infrastructure projects described by the World Bank in its recent report, providing infrastructure services may develop into a major export market. However, implicit in this argument is that governments in awarding infrastructure contracts should adopt an explicit preference in favour of domestic firms, even where foreign firms could provide a superior or cheaper service, thus 'taxing' domestic users or taxpayers, directly or indirectly, in the short run. As with infant-industry arguments that have been invoked over the past century to justify trade protectionism in various contexts,⁷² such policies may promote and preserve firms or industries that have a long-term comparative *disadvantage* and the 'tax' on users or taxpayers equally

71 Gomez-Ibanez and Meyer, *supra* note 42, 101.

72 See Robert Howse and Michael Trebilcock *The Regulation of International Trade* (London: Routledge 1995) chapter 1.

becomes permanent. In addition, the increasingly stringent government procurement and foreign investment provisions that have been adopted in NAFTA and the Uruguay Round agreement of the GATT may in some cases elicit justifiable complaints by foreign governments or firms of discrimination.⁷³

D. THE STATUS OF GOVERNMENT AS A PARTY TO THE PARTNERSHIP CONTRACT

So far, we have emphasized the problems inhering in public/private partnerships owing to the nature of infrastructure assets, and the distinct design problems related thereto. However, as alluded to earlier, a fundamental problem for these partnerships relates to the status of government as a party to the contracts. Because of its inherent legislative powers, government involvement presents distinct and quite vexing contracting problems.⁷⁴ First, particularly in countries such as Canada that lack constitutionally entrenched property rights, governments are able to abrogate express contractual commitments through legislative fiat. In other words, even where the contracting parties have been able to anticipate and to contract *ex ante* for the risks of future acts of contractual opportunism by government, the ability of governments to nullify these contracts through express legislative amendment attenuates the degree to which private parties can rely on governmental contractual undertakings.⁷⁵ Consequently, the value of even an express contractual commitment to provide fair compensation in the event of a

73 *Ibid.* chapters 6 and 11.

74 The lack of institutional safeguards against government takings is interpreted by Douglass North as a critical constraint on the pace of national economic development. See Douglass C. North *Institutions, Institutional Change and Economic Growth* (Cambridge: Cambridge University Press 1990); and Douglass C. North and Barry R. Weingast 'Constitutions and Commitment: The Evolution of Institutions Governing Public Choice in Seventeenth-Century England' (1989) 49 *J. of Econ. Hist.* 803. See also Spiller, *supra* note 69, 387; Brian Levy and Pablo Spiller 'Regulation, Institutions, and Commitment in Telecommunications' in *Proceedings of the World Bank Conference on Development Economics* (Washington, DC: The World Bank 1994); and Pablo Spiller and Ingo Vogelsang 'The Institutional Foundations of Regulatory Commitment in the UK' draft paper dated 16 June 1994, on file with the authors.

75 This is the paradox of sovereignty. The 'greater the sovereign's ability to impel submission by citizens, the less the ability of a third-party arbiter to compel performance by the sovereign, and so the less the sovereign's ability to induce voluntary cooperation. *This paradox turns the sovereign's power into the sovereign's handicap.*' David D. Haddock 'Foreseeing Confiscation by the Sovereign: Lessons from the American West' in Terry L. Anderson and Peter J. Hill (eds) *The Political Economy of the American West* (Lanham, Maryland: Rowman & Littlefield 1994) (emphasis added).

'taking' is subject to doubt. Second, even where governments face constitutional or other institutional constraints on their power to confiscate outright the undertaking of a private owner/operator, considerable contractual design problems emanating from the breadth of governmental policy powers remain. Here, it is difficult *ex ante* for parties to anticipate the myriad ways in which governments can infringe the franchise value of the private investor. Simple cases, such as when government transfers title or establishes a competitor to the investor, can be anticipated in advance, and can be restrained by the judiciary. However, beyond these simple cases, the task of design is rendered much more difficult. For instance, in the case of an asset like an airport terminal, changes in transportation, environmental, occupational health and safety, or regional development policy could all adversely impact the franchise value of the undertaking. Not only is the range of possible 'takings' difficult to anticipate in advance, but it is also difficult to differentiate legitimate governmental actions from those actions which are nothing more than a thinly disguised attempt to debase the value of the investors' interests, leaving investors with little choice but to tender their interests in the project to government on exploitative terms.

The problem in differentiating permissible from impermissible governmental modifications of state contractual commitments is graphically illustrated by the experience of the United States Supreme Court in interpreting the Constitution's contract clause, which prohibits states from enacting laws impairing the obligation of contracts.⁷⁶ The clause was first interpreted by the Court in cases involving public grants, such as *Fletcher v. Peck*,⁷⁷ and *Dartmouth College v. Woodward*,⁷⁸ wherein the Court prevented state governments from abrogating contractual obligations that were explicitly made to private beneficiaries. However, by 1837, the Court began to retreat from an expansive interpretation of the contract clause, by, for instance, declining to incorporate into a toll-bridge charter an implied promise by a state not to authorize construction of a competing bridge, even though this would severely affect the value of the franchise that had been

76 Article 1, subsection 10 of the Constitution. Although there is no explicit constitutional provision that imposes a similar constraint on the federal government, it is arguable that the Fifth Amendment's due process clause may have (or had) this effect: see Laurence Tribe *American Constitutional Law* 2d ed. (Mineola, NY: The Foundation Press 1988) 613n1. See also *Bowen v. Public Agencies* 477 US 41 (1986).

77 6 Cranch (10 US) 87 (1810).

78 4 Wheat. (17 US) 518 (1819).

awarded.⁷⁹ By the late 1930s, the clause fell into virtual disuse, a situation which was not reversed until the Court's decision in 1977 in *United States Trust Co. of New York v. New Jersey*.⁸⁰ In that case, the Court prohibited New Jersey and New York from repealing a statutory covenant that earmarked certain revenues and reserves from rail transportation as security for state borrowings. The states sought to use the funds to subsidize rail passenger transportation. The Court held that the contract impairment was not reasonable and necessary to serve an important public purpose, in this case, state transportation, energy, and environmental goals.⁸¹ Nevertheless, under the *US Trust Co.* doctrine, it is clear that cases involving more subtle debasement of the state contractual or quasi-contractual commitments could still withstand constitutional scrutiny where the end to be achieved could not be achieved through alternative means.⁸²

In any event, as demonstrated by the federal government's decision to abrogate its contractual commitments to the Pearson Development Corporation in respect of the TIT2 development, it is clear that the scope for governmental modification (or abrogation) of state franchise contracts is more than speculative. This problem of government opportunism is, however, by no means novel in Canada. In an exhaustive analysis of the performance of long-term franchise contracts governing natural monopolies in a range of different industries (electricity, railways, telephony, tramways, water, and gas) from the mid-1800s to the 1930s in Canada, John Baldwin argues that infirmities in the institutional environment enabled governments to exploit opportunistically the sunk investment costs of franchise operators, ultimately leading to a general contractual failure that resulted in a form of vertical integration that linked consumers and suppliers, namely high levels of state ownership of such assets.⁸³ Baldwin cites several

79 *Charles River Bridge v. Warren Bridge* 36 US (11 Pet.) 420 (1837).

80 431 US 1 (1977).

81 In subsequent cases, the Court has emphasized that state abrogation of its own contractual commitments will attract considerably less curial deference than state legislative interference with private contracts generally. See, for instance, *Keystone Bituminous Coal Assn. v. deBenedictis* 480 US 470 (1987).

82 For an analysis of the revival of the contract clause see Bernard Schwartz 'Old Wine in Old Bottles? The Renaissance of the Contract Clause' in Philip B. Kurland and Gerhard Casper (eds) *The Supreme Court Review* (1979) 95-122; and Richard A. Epstein 'Toward a Revitalization of the Contract Clause' (1984) 51 *U. Chi. LR* 703.

83 John Baldwin *Regulatory Failure and Renewal: The Evolution of the Natural Monopoly Contract* (Ottawa: Economic Council of Canada 1989); see also Christopher Armstrong and H.V. Nelles *Monopoly's Moment: The Organization and Regulation of Canadian Utilities 1830-1930* (Toronto: University of Toronto Press 1986).

examples of contractual failure leading to nationalization: the decision by the federal Board of Railway Commissioners to limit the freight rates charged by private railways during a period of rapid price inflation, resulting in the demise and nationalization of two major railways;⁸⁴ the Manitoba legislature's threatened imposition of a discriminatory tax on Bell Canada's operations in the province as a prelude to nationalization by the province;⁸⁵ and the Ontario legislature's use of legislative amendments designed to abrogate contractual and legislative commitments made to investors in power generation and distribution, electric tramway, and electric lighting franchises; all in an effort to bolster the prospects of a newly created provincial electric utility – Ontario Hydro.⁸⁶ Baldwin's claim is that the source of the failure of private franchise contracts in Canada resides in weak judicial traditions (specifically, a failure to regard governmental action other than an outright taking of title as a taking) and the absence of constitutional protection for property rights.⁸⁷ Had the institutional regime been structured differently, Baldwin speculates that private ownership subject to regulatory oversight would have been a viable substitute for nationalization – a course of evolution more typically followed in the United States.⁸⁸

Interestingly, many of the franchise contracts concluded during the period of Baldwin's study had properties strikingly similar to the public/private partnerships observed today. The contracts were long term, involved durable assets in areas where technology and demand conditions were changing or, at least, somewhat uncertain, and often contemplated government equity interests in the project through a fixed or varying level of participation in gross revenues. Further, the contracts, at least in the initial stages of their evolution, specified the obligations of the parties in vague, aspirational terms, a feature which ultimately forced the parties to develop more elaborate contractual mechanisms (through more detailed specification of terms and the creation of arbitral governance mechanisms) that would deal with

84 Grand Trunk and Canadian Northern. See discussion in Baldwin, *supra*, chapter 4.

85 Baldwin, *supra* note 83, 73–4.

86 To be fair, the government's actions followed a series of failed attempts to compel the electric rail and lighting franchisees to abide by the terms of their earlier contract. See discussion in Baldwin, *supra* note 83, chapter 10.

87 Many of these same themes are developed by George Priest 'The Origins of Utility Regulation and the Theories of Regulation Debate' (1993) 36 *J. of Law & Econ.* 289.

88 See also George Priest, *supra*. In contrast, Spiller argues that some countries were able to achieve significant levels of governmental commitment in respect of up-front private sector investments by relying on judicial enforcement of governmental licences. However, this mechanism imposed costs in terms of forgone adjustment to changing circumstances (Spiller, *supra* note 69).

adjustment to changing contracting conditions, both on renewal and before.⁸⁹ The question then arises as to whether the current institutional environment renders the contractual adjustment problems studied by Baldwin moot. While the role of the judiciary in constraining governmental opportunism through contractual interpretation is subject to debate, there is still no constitutionally entrenched contract or property rights clause in Canada, attenuating the constraints that could be imposed on government. Moreover, while certain international obligations (chapter 10 of the North American Free Trade Agreement, for example) constrain governmental actions in respect of procurement decisions, the constraints on ex post governmental action are much weaker.⁹⁰

Given the dearth of formalized institutional constraints on governmental opportunism, what constraints will currently operate to ensure governmental fidelity to contractual undertakings set out in the public/private partnerships? One possibility is that governments will provide hostages to support the initiatives.⁹¹ For instance, to the extent that private sector operators have developed considerable expertise in the operation and maintenance of the projects as a result of learning, then the decision to expropriate the franchise may imperil these human capital investments. Alternatively, depending on the operation of reputational markets, a decision by the government to expropriate the undertaking may damage its reputational investment, and raise the costs to it of contracting with subsequent parties.⁹² Of course, to be effective, third parties must be able to observe the government's conduct and discern that it is opportunistic in character. To the extent that public/private partnerships are not one-off affairs, but rather are a frequent and predictable component of government policy-making, then the costs to government opportunism, in terms of forgone future benefits, should be correspondingly increased. In this respect, it is arguable that the *current* costs to government of impairing its obliga-

89 The same point is made by Priest, *supra* note 87, who argues that the theories used to explain the role of regulation in natural monopolies (public interest or industry capture) ignore the functional similarity between regulation by public commission and several contractual innovations found in long-term franchise contracts.

90 See Evan Atwood and Michael Trebilcock 'Public Accountability in an Age of Contracting Out' *Can. Bus. LJ* (forthcoming).

91 Oliver Williamson 'Credible Commitments: Using Hostages to Support Exchange' (1983) 73 *Am. Econ. Rev.* 519.

92 For a general discussion of the operation of reputational markets, see David Charny 'Nonlegal Sanctions in Commercial Relations' (1990) 104 *Harv. LR* 373.

tions to holders of debt of public/private partnership are much greater than to the equityholders. In the former case, whether expressly guaranteed or not, impairment of a debt obligation associated with a public/private partnership could have dramatic and severe effects on government's capacity to finance its broader borrowings.⁹³

Yet reputational mechanisms alone may not be a sufficient constraint on governmental opportunism.⁹⁴ One possible response is to develop institutions that are capable of augmenting the restraints imposed by reputational markets. That is, at the time of contract formation, government could commission an arm's-length review of the contract to certify the integrity of the selection process, the contract's congruence with the proposal submitted by the winning bidder (recall the lock-in problems relating to the lag period between the decision to award the contract and the actual execution of the contract), and the compatibility of the project with applicable public goals and concerns. Alternatively, and less ambitiously, the evaluation panel that oversaw the selection process could be required to write and release publicly a summary of their evaluations of the competing bids and their reasons for preferring the winning bidder over the remaining bidders. Assuming that a project has been vetted and vindicated through such a review process, the costs to government abrogation of the contract on grounds of alleged process or substantive frailties should be magnified considerably. Another option is to limit independent review to *ex post* evaluation – that is, only those cases where government decides to renege on its contractual undertakings. While such review might economize on the costs of certification, these savings would come at the cost of heightened private sector uncertainty respecting the status of the contracts. In any event, if government does opt for a regime predicated on *ex post* review, the process would have to be considerably more rigorous and objective than the highly politicized process invoked by the federal government to analyse the T1T2 airport deal.

93 Interestingly, the interests between equity and debt holders in respect of a confiscation of an infrastructure undertaking may diverge quite radically, to the extent that government appropriates the equity investment only. In this case, the default risk to debt holders will be reduced by having government more closely associated with the undertaking, thereby enhancing the underlying value of debt. Conversation with Duncan MacCallum, Gordon Capital, October 1994.

94 Jeremy Bullock and Kenneth Rogoff 'A Constant Recontracting Model of Sovereign Debt' (1989) 97 *J. of Pol. Econ.* 155 (more complex institutional arrangements necessary to support state opportunism than reputation alone).

In considering the desirability of these measures, it is important to stress that ex post constraints on government conduct, such as mandatory compensation based on expectation damages, may prove efficacious only in respect of relatively stark types of governmental opportunism. For more subtle types of impairment, that is, takings through generalized policy initiatives, the case for conferring explicit protection on parties making infrastructural investments seems no different in kind from the case that obtains for actors having made investments in other industries, the value of which are subject to change as the result of government policy changes. In these cases, Kaplow has argued persuasively that government compensation for losses occasioned by regulatory change is undesirable as it would distort incentives for market-based risk management.⁹⁵ But so long as government continues to own infrastructure assets that are similar in character to those subject to public/private partnerships, then the incentive for opportunistic expropriation through generalized (non-targeted) initiatives is reduced.⁹⁶ This is because government will suffer losses on its infrastructure investments similar in character to losses sustained by private infrastructure investors.

Nevertheless, for relatively stark takings, the case for some type of protection through expectation damages or injunction is more robust. To the extent that legal and non-legal sanctions are inadequate, investors will rely on the pricing mechanism to protect their interests – that is, by impounding the expected cost of confiscatory action by government into the price that the investor is willing to pay for the franchise. Under this scenario, the costs of future expected opportunism are reflected back onto government in the form of a lowered rate of return to government from the proposed infrastructure project or a higher expected risk premium. Alternatively, private investors may need

95 Lewis Kaplow 'An Economic Analysis of Legal Transitions' (1986) 99 *Harv. LR* 509. Contrary views of the scope of government obligation in respect of generalized takings are developed in M. Graetz 'Legal Transitions: The Case of Retroactivity in Income Tax Revision' (1977) 126 *U. Pa. LR* 47; and J. Mark Ramseyer and Minoru Nakazato 'Tax Transitions and the Protection Racket: A Reply to Professors Graetz and Kaplow' (1989) 75 *Va. LR* 1155.

96 This, of course, assumes that governmental actors respond to financial incentives in the same way that private actors do. See discussion in David Cohen 'Regulating Regulators: The Legal Environment of the State' (1990) 40 *UTLJ* 213; and 'Suing the State' (1990) 40 *UTLJ* 630 (government officials have only weak incentives to minimize costs, as excess costs can be transferred to taxpayers or to different institutions of government). However, for a contrary view, see H. Kee 'Incentives and Rewards in the Public Sector' (1986) 29 *Can. Pub. Admin.* 545.

to be induced into making up-front investments by government subsidies (perhaps in the form of transfers of assets having an ongoing stream of earnings) and/or financing guarantees to generate needed equity funds. Both of these responses result in more highly leveraged capital structures that induce excessive risk taking by project managers.⁹⁷ A final pricing-related strategy is for project managers to compress the payback period for investment, which may have distortionary effects on risk taking and/or on capital structure. In any event, it is important to stress that from the perspective of a government that is intent on keeping its promises, the inability to credibly commit its intent is costly, and heightens the importance of devising workable and durable institutional mechanisms that are responsive to this problem.⁹⁸

IV *Conclusion*

A central theme of this study has been the considerable complexity entailed in the use of public/private partnerships designed to realize productive efficiency gains in the development and operation of physical infrastructure projects. In all of the case studies we explored, the details of the institutional and contractual framework proved central in determining whether the infrastructure projects were likely to generate welfare gains over alternative modes of organization. Since, save for one of the projects we examined, all of the case studies developed in the study are in the design or construction stages, the task of evaluating the long-term efficiency consequences of these arrangements is somewhat speculative. Nevertheless, examination of the incentive effects of both the selection processes and the contracts involved in these projects provides a foundation upon which reasonably robust conclusions can be drawn about the likely performance of these projects, and the broader implications for policy-makers seeking to enhance the efficient delivery and operation of physical infrastructure, both in developed and developing countries.

Commencing with the project selection stage, a first important lesson concerns the premium that policy-makers should place on responsible project selection through explicit and searching cost-benefit analysis. Whatever the merits of arguments which purport to link infrastructure

97 Importantly, because of explicit or implicit government guarantees, creditors may be indifferent to socially excessive levels of risk taking, and will not devise restrictive covenants on project managers.

98 See Spiller, *supra* note 69.

with productivity more broadly, it is clear that in a setting of scarce resources, policy-makers will be required to make choices among competing infrastructure projects. While some have advocated the use of public/private partnerships as a means of certifying or confirming the alleged welfare properties of proposed projects, the design of the arrangements governing the projects analysed in the case studies demonstrates the limited value of such an enterprise. Each of the projects studied reveal important – albeit sharply varying – levels of embedded public financial assistance. As argued earlier, once the state insinuates itself into these projects by, for instance, providing assurances of annual subsidies or of subsidies conditioned on the project's underlying financial performance, the market's capacity to undertake an independent valuation of the project is compromised. The problem with relying on private markets to make these quintessentially public choices was graphically illustrated in the study of the PEI Fixed Link, where policy-makers misleadingly touted the private sector's interest in the highly subsidized project as objective and tangible evidence of its societal value. Yet in the light of the various rationales for intervention enumerated in the first part of this study, the market's capacity to make legitimate judgments respecting the underlying social value of these projects, even when unclouded by state financial assistance, is of dubious value.

Assuming that threshold problems of general project selection can be surmounted (that is, that the most valuable projects are selected for development in descending order of their social value), and further that a public/private partnership model constitutes the best means of organizing the project, then the next challenge is to devise a process that can identify the most deserving project and/or developer/operator, while ensuring fidelity to political legitimacy concerns. In considering this issue, it is important to emphasize the role that auctions play in economizing on endemic information problems when valuing highly idiosyncratic assets. In all of the infrastructure projects that were examined, there were no obvious benchmarks that policy-makers could invoke to determine what the minimum return necessary was to entice private developers to deliver and operate these projects; hence, the attraction of the competitive auction.

Nevertheless, the traditional information revelation function of auctions is best served when the good subject to allocation is stable and well defined. But, the highly bundled character of most public/private partnerships poses formidable problems for the design of a competitive bidding process. On the one hand, through reliance on vague and nebulous project definitions and standards, bidders will have the

latitude necessary to propose novel solutions in response to the government's request. Under a more rigid bid structure, the prospect that these ideas would be created and then developed into a concrete proposal would be rendered much more remote. Quite simply, if the narrow and quite detailed standards enumerated in traditional government procurement competitions were to be used to develop large-scale infrastructure, the room for private sector innovation and creativity would be very considerably circumscribed. On the other hand, the less crystallized the project, the more expensive it will be for bidders to participate in the process. This expense derives from the out-of-pocket costs that bidders must incur in incorporating a creative design component into the proposal process and the risk that decision-makers will evaluate proposed projects on factors unrelated to the underlying merits of the proposal. As these *ex ante* bidding expenses increase in magnitude, so too does the need for *ex ante* compensation necessary to entice bidders to participate in the process in the first place. In other words, ideas matter, but the government will have to pay for them one way or another, and the question really is how that price is best paid.

So far, the merits of the multidimensional auction process for public infrastructure projects has been viewed from a strictly efficiency perspective. But given the high levels of public funding typically involved in these projects, it is important to be cognizant of the important political legitimacy values that are implicated. One need only recall the rather intense outpouring of public sentiment surrounding the redevelopment of the Pearson terminals to realize the centrality of these values in this area. Here, it is apparent that even if there are tangible efficiency gains that can be realized through a multidimensional bidding process, the public's inability to monitor systematically the selection process involved in the allocation of projects costing upwards of a half a billion dollars becomes salient.

Assuming that infrastructure projects can be allocated to the most deserving bidder through the auction process, the next, and most daunting, problem relates to the contractual design mechanisms used to alleviate the opportunism problems inhering in these projects. One of the major problems that must be confronted in these partnerships relates to asset degradation, which reflects the fact that these physical infrastructure projects typically have expected lives which extend well beyond the term of the lease, and which thus create troubling incentives for chiselling on asset maintenance. The costs of devising and enforcing contractual solutions to temper these problems must be balanced against the efficiency gains sought to be realized through the public/private partnership.

In determining whether the public/private model is a suitable means for organizing production of a specific physical infrastructure project, it is useful to highlight what these precise efficiency gains are. As discussed earlier, the principal benefit of the public/private partnership over traditional procurement models in the delivery of physical infrastructure resides in the bundling or integration of the finance, design, construction, and operating functions. Integration promotes the formation of cross-functional expertise and also ensures more disciplined performance of these functions than would be observed were government required to separately contract for the performance of each function on its own. Nevertheless, the case studies developed in this article raise doubts surrounding the likelihood of these benefits being realized on the scale contemplated by their proponents.

The most significant problem stems from *de facto* unbundling of the bundled partnership. Again, a striking, indeed recurrent, feature of the public/private partnership is the high degree of government financial assistance. The simplest explanation for the assistance relates to the need to subsidize public goods or to compensate for positive externalities. Yet, if these goals were the exclusive motivation for government assistance, we would expect to see simple one-time subsidies being funnelled to project developers instead of the more complex financial risk-sharing contracts that are documented in this study. Why, given the loss of integration benefits entailed by such financing, do governments decide to intervene in the provision of infrastructure in this way?

Perhaps the most important factor explaining the persistence of public financing relates to the risks of governmental contractual opportunism faced by private developers in the development and operation of physical infrastructure projects. In a first-best world, the risks embedded in the development contract might be divided between the government and the contractor in a manner that makes the private developer responsible for the endogenous production risks and the government responsible for risks of infringement through policy changes. Each party is the least-cost avoider of the risks that it has been assigned. Exogenous risks, that is, risks that neither party can control, should be transferred to the least-cost insurer, in this case, the government, owing to its superior risk-bearing capacity.⁹⁹ Unfortunately,

99 The claim that government constitutes the lowest-cost insurer, hence the best risk bearer, of exogenous risks is criticized by George Priest in the context of losses caused by catastrophic events: see 'The Government, the Market, and the Problem of Catastrophic Loss' (paper presented at the Conference on Social Treatment of

however, the first-best contractual allocation of risks is not realizable in this setting, given problems of contractual design. Put simply, a fully contingent contract outlining the limitations on governmental conduct cannot be specified owing to endemic foreseeability problems. But, even if such a contract could be devised, it is, of course, apparent that in the light of political and constitutional realities, government contractual commitments in respect of risks over which it has direct control would be virtually impossible to specifically enforce. Its inherent legislative and regulatory jurisdiction makes the contract susceptible to unilateral *ex post* opportunism by a government which has changed, or which has changed its mind. The problems of unanticipated government action are, of course, pervasive in the modern regulatory state, but what makes these problems particularly acute in the case of physical infrastructure are the higher level of risks that reflect the sunk costs, anticipatory, and asset lumpiness properties of such investments.

It is the combination of government inability to credibly commit to non-confiscatory measures, combined with high probabilities (and accompanying costs) of such intervention, that makes the first-best contractual solution unattainable, and which remits parties to the second-best world. It is here that the sundry financial arrangements observed in the various public/private partnerships become more readily understandable. In the absence of nuanced contractual risk-allocation mechanisms, government risk-bearing through the supply of financial capital will attenuate the apprehensions of private developers over future governmental action. So doing will ensure that projects that might otherwise be negative net present value decisions will be undertaken by the developer. At the limit, government will supply all of the risk capital and the private developer will work on a cost-plus basis. But while this contract saves the developer harmless from the costs of future government action, it does so at too high a price; in terms of the optimal balance between incentives and insurance, the arrangements provide excessive insurance, increasing the likelihood of developer moral hazard, which impairs the productive efficiency gains that motivated the use of the bundled organizational form in the first place; hence, the value of more complex intermediate financial arrangements that do not dampen developer incentives for cost containment but do

Catastrophic Risk, Stanford University, Lucas Conference Center, draft dated 21 October 1994). Among other claims, Priest argues against government superiority in risk bearing on grounds of government's inability both to evaluate and to sort risks to ensure a pooling of independent (not variant) risks.

provide some element of insurance. All of the projects surveyed in this study contain hybrid levels of financial risk sharing, whether achieved through well-specified subsidies or performance-based rental payments.

In this respect, it should be noted that the financial structure dictated by optimal risk bearing may also coincide with some of the imperatives of the tournament-based selection process. The auction theory literature, for instance, distinguishes between private and common values auctions. Whereas in the former, the underlying values relied upon by bidders to frame a bid are solely a function of the bidder's own costs, in the latter case a bidder can improve his underlying valuation of the good subject to auction by learning his competitors' valuations. Given the role of exogenous factors – such as the level and direction of network externalities, trends in customer demand, and government policy changes – the multi-stage tournament for the franchise is most accurately characterized as possessing both common and private values properties. McAfee and McMillan argue that where common value elements are present in an auction, conditioning payment for the good on a royalty payment will generate more competitive bidding because the significance of inherent differences in bidder valuations is reduced.¹⁰⁰

It is well known that contractual equilibria are conditioned on a number of external factors, one of the most important being the institutional framework for contractual enforcement. In Canada, the unfortunate events surrounding the abrogation of the Terminals 1 and 2 project, a related decision, amidst the public uproar over the Terminals 1 and 2 contract, to abandon a proposed private runway development project at Pearson International Airport after bids were received but not opened, and the ex post modifications to the terms of the Highway 407 bidding process, have all contributed to legitimate concerns over government motivations, creating an environment which is becoming less congenial to these projects. To remedy this situation, supplemental institutions will have to be created which will support durable government commitments.

In a thoughtful article on the relationship between institutions and government commitment making and keeping, Levy and Spiller have expressed caution with the degree to which institutional arrangements designed to support public commitment can be successfully transferred

100 R. Preston McAfee and John McMillan 'Auctions and Bidding' (1987) 25 *J. of Econ. Lit.* 699, 717-9.

across countries.¹⁰¹ The claim is that if underlying social, political, and constitutional factors – so-called institutional endowments – are not supportive of restrictions on governmental action, then the imposition of complex institutional arrangements designed to fetter arbitrary governmental action will be ineffectual. In this setting, other options, involving, *inter alia*, innovative transactional engineering, widespread public investments and monitoring by supra-national institutions are required. In the case of public/private infrastructure partnerships, the often *sui generis* nature of the projects, the difficulty of specifying clear outputs, the capacity of governments to confer broad gains on ratepayers by imposing price restrictions on investor operators, the need for project flexibility, all combine to subvert the capacity and cost-effectiveness of domestic regulatory or judicial remedies aimed at constraining governmental opportunism.¹⁰² In this setting, greater reliance may need to be placed on supranational institutions, such as the GATT, regional trading blocks, or the World Bank. One possibility is for the bid protest and expropriation provisions currently set out in the North American Free Trade Agreement to be enlarged to include domestic as well as foreign firms. Alternatively, international public and private lending agencies could agree to condition the provision of investment on governmental adherence to independent arbitral decisions made in respect of alleged governmental takings.

In any event, if the public/private partnership is to realize the expectations of its proponents, a more systematic and objective means of reconciling government's need for policy flexibility with the market's need for certainty must be devised. The *ad hoc* and politically motivated inquiry, such as that undertaken by Robert Nixon to evaluate the merits of the Pearson redevelopment project, will simply not suffice to allay market fears over capricious government action in respect of these investments. Nor, on the other hand, are conventional forms of judicial review of government actions likely to possess the institutional expertise to evaluate credibly the integrity of the decision-making process entailed in such large and complex projects.¹⁰³ In the absence of such

101 Levy and Spiller, *supra* note 74.

102 And while *ex ante* certification procedures may assist in resolving these problems around the time of project construction, as soon as the project commences operation, several explicit or implicit modifications will be made to the formal contract which, in turn, will subvert the value of the earlier certification exercise and render the owner/operator susceptible to a charge that these changes are in bad faith and abusive.

103 See Atwood and Trebilcock, *supra* note 90.

institutional innovations, one cannot dismiss the possibility that the current wave of enthusiasm for private sector development of public infrastructure in both developed and developing economies may turn out to be little more than a form of political 'cycling' that will replay the demise of the municipal franchise contract in Canada and the United States early in this century. Let us hope that we will not be condemned to repeating the errors of history by neglecting that history.

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