28 EXPANDING THE URBAN TRANSPORTATION INFRASTRUCTURE THROUGH CONCESSION AGREEMENTS: LESSONS FROM LATIN AMERICA

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Introduction

In recent years, several countries in Latin America, and around the world, have met the challenge of developing and expanding critical infrastructure by promoting private sector participation in the infrastructure sectors. Recognizing the relevance of the infrastructure sectors for the economic development of firms and industry and the well-being of the population, and given increasing constraints on public budgets to finance these impending needs, governments have sought to shift part of the burden of infrastructure investments to the private sector.

Concession agreements are an instrument for facilitating the participation of the private sector in infrastructure development. A concession agreement for urban transportation infrastructure refers to an arrangement in which a national or subnational government transfers the construction, operation, and maintenance of transportation assets (or the right to do so) to a private entity. This includes infrastructure related to passenger rail systems, busways, and motorways in urban areas. Ultimately, governments retain ownership or the right to supply the service whilst transferring (some) construction and operation risks to the private sector. If concessions are awarded through competitive bidding, they draw economic benefits from creating competition *for* the market as opposed to *in* it (Shaw, Gwilliam and Thompson, 1996).

There are other ways to bring the private sector to the transportation infrastructure market: outsourcing, management contracts, and divestiture by license or sale. For purposes of this paper, these arrangements are not counted as concessions. Other arrangements, such as merely the right to operate in a given market, are commonly called "concessions" but also fall out of the definition scope provided here.

The main motivations for seeking private sector participation in infrastructure projects are found in the poor performance record of state-owned monopolies in its construction and operation. Supporters cite a number of financial and economic reasons. Specifically, most arguments in favor of concession agreements can be summarized as: potential increases in economic efficiency (Gómez-Ibañez and Meyer, 1992 and Engel et al., 1997); an apparent improvement in government's fiscal burden; the availability of an expanded pool of capital that would otherwise have not existed; and an improvement of the public's image of the delivery of public services (Mizutani, 1994).

Critics argue that debates around finance and construction costs, although important, tend to involve transfer payments from one group, say road users or traditional road contractors,

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to other groups such as taxpayers, which by itself may not constitute economic efficiency gains. A drawback commonly cited is that total cost of infrastructure construction and operation may be higher with a concession than with a conventional approach. This is due to higher transaction costs (Tiong, 1995), the cost of higher risks entailed by the private sector, in some instances the lender's perception of lower credit-worthiness of the project promoter, and the risk aversion of investors beyond what a government considers legitimate. The last two costs can certainly be avoided under a conventional public tendering approach (Blackshaw, Flora, and Scurfield, 1992).

In attempting to illuminate the discussion around the effects of concession agreements on economic efficiency and public finances, this paper analyzes the role of overall project risk and the related government-backed risk guarantees on reaching successful closure of a concession deal. Risk and risk-guarantees are characteristics of concession agreements that directly affect the stakeholders involved and ultimately impact the long-term economic and financial viability of a project.

This paper argues that features of large infrastructure projects (such as high capital costs and asset indivisibility) together with urban transport-specific characteristics (such as high intermodal competition and the uncertainty of forecasting demand), and characteristics common to most developing countries, such as incipient financial markets, contribute to a high level of project risk. High risk levels, in turn, severely constrain the ability of finding private financial support for the project. In order to test the validity of the hypothesis, five attempts to develop infrastructure via concession agreements in Latin America were selected. Argentina, the only success story, has awarded subway, commuter rail and a few urban road concessions in Buenos Aires.[1] Brazil and Colombia, in contrast, reached advanced stages in awarding concessions for urban busways in São Paulo and Bogotá, respectively, but the concessions failed to materialize, apparently due to the lack of financial support. The State of São Paulo succeeded in awarding one busway concession. The prominent features of the concession program in each case are analyzed. As a result of the difficulties of reaching project closure, governments can opt for either building the infrastructure through the conventional tender approach or to mitigate project risks by providing risk guarantees. However, government-backed risk guarantees are expected to have far-reaching effects on national budgets and the health of a nation's finances.

Case Studies

The three case studies represent the population of concession agreements attempted to date in Latin America. Additional concession agreements, in these and other Latin American countries, are currently being sought. Abundant information about the process and outcomes of the concessions in Argentina exist due to the program's initial success. Colombia and Brazil's limited success with urban transport concessions may explain the limited information that exists about the process and features of each agreement. The next sections provide a broad overview of the major urban transport concession(s) attempted in each country.

Buenos Aires, Argentina

Passenger Rail Concessions

Since the early 1960s, passenger rail services in the Buenos Aires Metropolitan Region (BAMR) were organized under Ferrocarriles Argentinos (FA). Under this arrangement, each of the six commuter rail divisions that converged in Buenos Aires was responsible for freight and passenger services. Service delivery problems developed during the 1970s. Contributing factors leading to the service decline included a production-oriented culture with little regard towards customers, increasing competition from bus transport and private auto, and weak rail management executing poor railway investments. A decline in rail ridership was evidence of FA's systemic deficiencies. Simultaneously, increases in income and the subsequent effects on motorization levels contributed to the increase in the demand for road space. By the end of the 1980s, FA passenger rail services had become unreliable, stations were badly deteriorated, fare evasion was remarkably high and accidents were increasing. In spite of population increases of 120 percent over FA's life, railway traffic over the same period decreased to half of its original level.

In 1990, of all state enterprises, FA was responsible for the largest drain on the national treasury—about $1.4 billion annually, of which about 25 percent were incurred by the suburban rail network. By 1991, a fully staffed Railway Restructuring Unit created within the Ministry of Economics and Public Works was in charge of drafting the terms of solicitation and bidding documents for awarding a concession for rebuilding and maintaining the rail infrastructure and providing the transport services. As a whole, the government's objective was to reduce the federal subsidies financing passenger train operations. To this end, the government agreed to fully fund the capital improvement program specified in the call for bids. Therefore, private financing was not directly sought from concessionaires, but rather, the ability to implement a prescribed set of capital improvements efficiently. The fact that the overall level of private capital at risk was low might have proven critical to the success of this concession.

The subway and suburban railway services were grouped into seven bundles to be awarded independently. Concessionaires assumed the risks inherent in most business activities; however, since the system was functional, bidders had some indication about minimum expected usage levels. This reduced the risk level, even though benefits or costs resulting from differences between the demand realized and the predicted demand accrued directly to the operator. Bidding

documents defined the minimum service standards in terms of coaches per hour, frequency, travel times, percent on-time performance, and percent of cancelled trains. Also, maximum fares for standard service and fare increases as a premium for performance were established. Concessionaires had an incentive to exceed the standards set by the government because only then could they claim a fare increase. Chronic failure to meet these standards would result in penalties to the concessionaire. The duration of the concession is 10 years for the six commuter rail bundles and 20 years to the subway and remaining commuter rail line.

Concessions were awarded in late 1992 and early 1993. A voluntary retirement program was put into place to reduce the number of employees; a total of 32,000 workers retired from FA. Contracts were signed shortly thereafter and concessionaires took over operations of the lines during 1994 and 1995.

So far, based on performance criteria, the passenger rail concessions have succeeded in their stated goals. Table 1 shows changes in a few basic indicators for all the rail bundles given as concession. Part of the increase in passengers registered is due to the anti-fare evasion strategies implemented by concessionaires. However, even in the case of the subway, where fare evasion was deemed low before the concession, ridership between 1993 (the last year before the concession) and 1996 increased from 145.3 million to 198.9 million passenger trips. This represents a considerable 37 percent increase in three years. By the end of 1996, year three of the concession, subway traffic had surpassed the forecasts for year eight as stated in the bidding documents.

Buenos Aires Roadway Concessions

Plans called for the main access roads to Buenos Aires to be awarded as a concession concurrently with passenger rail concessions, but were administered through a different office within the Ministry of Economy and Public Works.

The government's aim was to rehabilitate, upgrade, and expand the road system in and around Buenos Aires with the least possible impact on government finances. To this end, the government's effort concentrated on achieving full user cost recovery of the reconstruction costs (Shaw, Gwilliam and Thompson, 1996).

Four main roads have been awarded by concession so far: Acceso Norte, Acceso Oeste, Acceso Ricchieri, and Autopista La Plata-Buenos Aires. With the exception of the latter, all concessions were awarded for existing routes. Therefore, bidders had important information available regarding current demand levels. Selection of the preferred bidder was made based on the lowest toll proposed (the government set a cap on the minimum feasible toll).

The concessionaire would collect tolls from users as soon as all public works were completed. The tolls were fixed in US dollar terms, though collected in pesos. Larger vehicles are charged a multiple of the basic toll, and the rate will be adjusted annually to reflect changes in the US consumer price index (CPI) from September 1993. The toll level in pesos will be recalculated monthly to reflect changes in the exchange rate levels. The bid parameter was the lowest toll; the government allocated the bulk of the revenue and operating risk to the private sector by requiring substantial performance bonds in its favor (Yates, 1994). The average length of the concessions is 22 years and 8 months. Under conditions of the contract, bidders were not allowed to charge tolls until the public works were fully completed.

All contracts except Acceso Norte have been renegotiated to allow toll collection before the works are completed (Acceso Oeste) or to maintain a bilaterally negotiated "economic equilibrium" (Acceso Ricchieri). Construction on the Autopista La Plata-Buenos Aires is ongoing. Acceso Norte has been a commercial success despite the fact there was only one bidder. The concessionaire priced at $1.30 per ride the project risks, which is slightly under the government-determined cap.

São Paulo, Brazil

The São Paulo Metropolitan Area (SPMA) has more than 15 million people in its greater metropolitan area, and covers

Table 1 Operational Performance of Passenger Railway Concessions

	Passengers (million)			Capacity (million car-km)			On-time performance*		
	1993	1996	Δ %	1993	1996	Δ %	1993	1996	Δ %
Suburban Railways									
Mitre	34.4	69.8	103%	16.3	21.7	33%	76	96	26%
Sarmiento	60.5	99.3	64%	20.3	23.7	17%	73	95	30%
Roca	64.9	136.0	110%	26	43.1	66%	81	96	2%
San Martin	21.7	43.5	101%	13.5	15.6	16%	83	90	8%
Belgrano South	2	11.1	462%	2.1	6.4	206%	46	95	107%
Belgrano North	11.8	28.8	144%	8.5	10.5	24%	85	85	0%
Urquiza	16.8	24.7	47%	8.5	9.7	15%	92	94	2%
Subway	145.3	198.9	37%	20.1	26.8	33%	23,165	9,013	-61%

*On-time performance for the subway is measure in minutes, representing the minutes of service disruption

more than 2,000 square kilometers. The region has a well-developed system of bus and rail. Two initiatives for developing transport infrastructure through concession agreements have been spearheaded by different governmental institutions. The *municipal government* awarded independent concessions for the creation of a network of integrated busways running on exclusive lanes. Lagging behind was the *State's program* of integrating municipal bus lines with the state-owned rail-based network using exclusive trolleybus corridors.

Municipality of São Paulo's Busway Concession

The Municipality of São Paulo's objective was to rationalize the network of public and private bus providers by creating 15 exclusive busways totaling 241 km. These busways would operate as trunk routes with bi-articulated buses. Private and public operators outside each corridor provided feeder service. Fare integration was guaranteed.

Contracts with several consortia were signed for a period of 8 years. The consortia selected would prepare the engineering and design works, as well as maintain the road, traffic lights and bus stops. The Municipality would amortize the infrastructure investments and also provide compensation for the operating costs. Costs would be determined by a predetermined formula that takes into account fixed and variable components.

A total of seven different concessionaires were selected to operate nine trunk routes. After having awarded the concession, the selected Consortia had to complete the project funding of their proposals. The Consortia were led to believe that the National Economic and Social Development Bank of Brazil (BNDES) would finance all or most of the project (Rebelo and Benvenuto, 1997). As it happens, the Consortia were unable to find funding for the project. Rebelo and Benvenuto (1997) provide a list of possible reasons why this innovative concession failed; interestingly enough, most of the reasons cited can be considered as consequences of either (explicit and implicit) contract incentives or the risk/reward tradeoffs faced by the concessionaire. These reasons will be covered in more detail in the next section of this paper. A striking reason that falls outside of the two previous categories, is the Municipality's failure to undertake an economic evaluation of the program. In fact, the BNDES argued that the proposed projects were financially but not economically viable. It argued, for example, that the level of latent demand for public transport travel warranted investments in a mode with higher capacity. Similarly, it suggested that the network effects of the investment (i.e., on rail and auto) also decreased the project's attractiveness.

State of São Paulo's Busway Concession

The São Mateus and Jabaquara project is a high-priority connection in the rail/bus integration attempt by the State. By the late 1980's a state public agency, the Empresa Municipal de Transportes Urbanos (EMTU), was made responsible for the development of this corridor. Due to a higher need than planned for public resources, the project was partially implemented in the traditional tendering way. The segregated right of way was built, but the corridor was partly electrified. In addition, diesel trolleybuses, as opposed to electric trolleybuses were selected as a preferred alternative. Currently, a private company provides operations of the corridor under contract (Rebelo and Benvenuto, 1997).

By mid 1990s a concession agreement for the full electrification of the corridor, conversion and expansion of the fleet to electric vehicles, and operation of the service found renewed interest. The corridor's current operations proved the existence of high demand levels. Similarly, private investment requirements were relatively low.

Bidding documents were prepared and a formal request for proposals was distributed. The concession period was 20 years, with the State specifying and enforcing minimum service levels. The State sets the tariff and reviews it periodically "to ensure economic and financial equilibrium" (Rebelo and Benvenuto, 1997); fare revenues accrue directly to the operator and no subsidy is directly provided by the State. The bid parameter was the highest percentage of gross revenues given to the State beyond a minimum 15% for contract management. In addition, the concessionaire has five years to convert the fleet to electric power. The concessionaire began operations in May 1997; no data about the performance of the concession is yet available.

Bogotá, Colombia

Over the last two decades, and despite having the largest bus fleet in the world, Bogotá has faced increasing problems for transporting its 6 million inhabitants. Its high altitude exacerbates pollution problems from traffic volumes and congestion. Confronted with these problems, the local administration decided to invite proposals for a concession to build and operate a mass transit system for the city. The explicit objectives of the concession were to widen public transport coverage by integrating the rail and bus modes, improve the environmental conditions, improve the level of service of transport, and support the development of planned land uses (Buchanan, 1995). Implicitly, and due to the experience of the Medellín metro[2], the local government wanted to minimize the public outlays associated with the construction of a large system and shift as much of the cost escalation risks to the private sector.

The terms of invitation were uncharacteristically vague; the city wanted bidders to be creative in their proposed solutions. Neither specific modes nor technologies nor the scope of coverage of the system were prescribed. Bidders were left to conduct independent demand analyses according to the scope of the solution proposed. The maximum duration of the concession period was 30 years.

Four bids (two heavy rail, one rail/bus, and one busway proposal) reached the economic evaluation stage. A foreign

consulting firm independently developed demand models that were used to evaluate the bids. None of the bids achieved a positive Net Present Value (NPV) in the evaluation (Buchanan, 1995). According to the evaluators, most of the proposal deficiencies stemmed from unrealistic assumptions made by the bidders, overestimation of demand and underestimation of costs.

The local government decided to promote the busway option in the interest of showcasing a major transport investment. The busway proposal (which included four busways) was selected because it achieved the highest NPV (the minimum economic loss). The consortia selected entered in negotiations with the government and substantial modifications to the original scheme were made. The stipulated duration of the contract was decreased to 23 years. Other specifications included charging a flat fare, which would also cover the feeder-distribution system.

In terms of risks, the concessionaire carried all financing risks of the program. The government would not support any part of the investment. Costing evidence would be required to support any requests for fare changes. The basic structure of the financing package was detailed in the contract, including the debt-to-equity ratios. The concessionaire was also asked to provide grant performance bonds to the Capital District for contract compliance, quality of service, payment of salaries, and for stability of the facilities. The total budget was $400 million for infrastructure and 400 bi-articulated buses (Shaw, Gwilliam and Thompson, 1996).

Unfortunately, the unavailability of potential sources of funds coupled with the unwillingness of existing transport providers to collaborate with the busway consortia halted the busway effort. By early 1996 the concessionaire had withdrawn its proposal, and the local authorities decided to develop segments of the busway the conventional way.

Key Features in Urban Transportation Concession Agreements

What made the Argentinean concessions and São Paulo's State Busway concession agreements successful? Why did Bogotá and São Paulo's Municipal Busway concession agreements fail? This section compares the capital investment, duration, exclusivity, tariff authority, and risk characteristics of the concession agreements introduced in the last section. These characteristics, summarized in Table 2, play a significant role in determining the likelihood of finding financial support, and hence, also determine the extent to which government participation in the concession is warranted. We believe they help explain the outcomes of the cases presented.

The way in which elements of a concession are combined is critical since it allocates risks between the government and a concessionaire. Clearly, some tradeoffs are required in combining the elements into a single package. Assessing, to the greatest extent possible, the concerns of the parties and reaching an appropriate balance to reach the objectives of the concession is the ultimate goal of designing the concession.

Table 2 Key Features of Concession Agreements Studied

Project Name	Duration (yrs)	Cost Responsibility	Government Policy Risk	Capital Investment Carried by Concessionaire	Exclusivity	Success
B. Aires Suburban Railways	10	Subsidy from or canon to Authority	Low	Low*	Low	Yes
B. Aires Subway and Railway Line	20	Subsidy from or canon to Authority	Low	Low*	Medium	Yes
B. Aires Access Roads	22.6	Carried by concessionaire	Low	US$160m/ 500m/250m**	Low	Yes
São Paulo State Busway Program	20	Carried by concessionaire	Low	Electrification of 14 km; Acquisition of 22 trolley buses & conversion of existing fleet	Low	Yes
São Paulo Municipal Busway Program	8	Municipality subsidy	Low	1000 buses and 241 km busway*	Low	No
Bogotá Busway Program	23	Carried by concessionaire	Low-Medium	$400m	Low	No

Source: Yates (1994), Rebelo (1997), and Shaw et. al. (1996)
* The government provided the capital necessary to realize these investments.
**Acceso Richieri/Norte/Oeste, respectively. Data for La Plata-Buenos Aires not available

Capital Costs

Urban infrastructure projects tend to have very high up-front capital costs due to the magnitude of the public works involved. In addition, a highway, busway, or railway has high location specificity; the assets involved have little alternative value. Therefore, investors have little comfort in what can be realized if the project fails.

Rail and bus operations assets, in contrast, are mobile (vehicles) or can have different uses (stations). The risks entailed by the lumpiness of the capital investment for infrastructure are compounded by concession schemes, where ownership reverts back to the government at the end of the concession period. As a result, investors will seek to cover their risks by either requiring a higher return or an earlier return on their investment.

As expected, the case studies suggest that the higher the concessionaire's financial commitment, the lower the chances of reaching financial success, all else held equal. Table 2 summarizes key features of the concessions studied. Argentina's rail concessions entailed a high capital investment, but the government specified the investment schedule and provided the funds. Small capital investments (compared to most road concessions) were required in the Buenos Aires' road concessions, mostly due to the repair and maintenance work required. Bogotá's concession investment requirements were considerable, and only comparable to São Paulo's Municipality Busway Program; however, Bogotá's project involved fewer buses and higher capital investment in the construction of exclusive rights of way.

Concession Period

A company must be satisfied that its capital investments can be recouped in a concession. The nature of the investment and the degree to which it is sunk in the current use are very important criteria. Worldwide experience in urban infrastructure concessions concentrates on passenger rail systems and highways, assets with high location specificity. Thus, when a concessionaire makes significant capital investments in a project, the duration of the contract tends to be longer than when the concessionaire is only an operator. The fixed location or "indivisibility" of the major assets, in addition to size and lumpiness of the capital investments, requires long payback periods.

The difference between the concession period of several worldwide concessions, including the five cases studied, are presented in Table 3. The duration of the concession reflects in part the government's a priori judgement of the level of risk of the project, and hence, of an appropriate payback period. However, governments can also arrange for a shorter concession by providing incentives such as tax credits that may make the investment viable (Shaw, Gwilliam and Thompson, 1996).[3]

The cases of Bogotá's and São Paulo's Municipality Busway concessions suggest the effects of asset mobility on concession periods. Most of São Paulo's program involved the purchase of buses, whereas Bogotá's project tied a large part of the capital investment to the exclusive right of way. This explains why the concession periods differ. Argentina's passenger rail involved relatively low investment risk, since the government was providing the capital, and hence the concession is also moderately short.

Lengthy concession periods are an important characteristic for developing countries. Due to market rigidities and structural deficiencies, capital markets in developing countries are inherently volatile; hence capital financing is scarce. Simultaneously, capital financing of infrastructure projects would be desirable in the long run, because bond financing is more conservative (requiring collateral or guarantees) and tends to imply a faster payback.

Exclusivity

Exclusivity is the degree of competition, (inter- and intramodal), for moving goods or passengers over a period of time. Exclusivity is critical because it directly determines the financial viability of a project. The exclusive right to own, construct, or operate infrastructure can be the major cause of monopoly power. Even though governments generally retain the ultimate control of these rights,

Table 3 Concession Duration for Selected Urban Transport Projects

Project	City	Type of Facility	Duration (yr.)
Suburban Railways	London	Railway	5-15
Municipality Busway Program	São Paulo	Busways	8
State Busway Program	São Paulo	Busways	20
Suburban Railways	Buenos Aires	Railway	10
Buenos Aires Subway System	Buenos Aires	Subway	20
Buenos Aires Access Roads	Buenos Aires	Motorways	22.75
Bogotá Busway Program	Bogotá	Busway	23
ORLYVAL	Paris	VAL to Airport	30
Don Muang Tollway	Bangkok	Motorway	30
Melbourne City Link	Melbourne	Motorway	34
Putra LRT II	Kuala Lumpur	LRT	60
Croydon Tramlink	Croydon (UK)	Tramway	99

concessionaires sometimes are given some degree of exclusivity.

Some degree of exclusivity is a result of natural monopolies. The high capital costs and site specificity of investments in urban transport infrastructure projects have some features of natural monopolies. For example, it is common to spatially monopolize the provision of rail transit, since it does not make sense to duplicate the costs in several firms by having parallel rail tracks in competition. In this context, proponents argue that a competitively auctioned concession would allow some of the benefits of competition to be brought to bear in the absence of actual competition. However, it is hard to determine precisely the degree of exclusivity of a transportation service in urban areas. In the case of a rail concession, for example, the degree of exclusivity of a concession is limited by competition from other modes such as private car, buses, jitneys, and walking.

The low degree of exclusivity of urban transport infrastructure projects with respect to other traditional infrastructure projects is key and may help explain the worldwide paucity of urban transport infrastructure concession agreements. Governments are limited in their ability to grant exclusive rights as this would amount to restraining all types of movements in the area in question. In the urban transport context, intermodal competition makes high exclusivity much harder to attain than in rural projects; this in turn makes demand estimation more complex. This means that, all other things held equal, urban transport infrastructure projects tend to entail higher commercial risk than non-urban projects. There are, however, other urban transport infrastructure concessions, such as river crossings, that have more traditional characteristics of natural monopolies with limited intermodal competition. In river-crossing instances, demand can be estimated with more precision and the government can have more control over granting exclusive rights.

The degree of exclusivity observed in the case studies selected does not vary considerably, since all projects are fundamentally urban transport projects. Upon closer examination of the cases, one might select the Buenos Aires Roadway Program as the project with highest exclusivity due to the length of the trips involved. Within suburb-to-center city trips, intermodal competition is generally limited due to the low densities at the trip origin. Information on the other cases suggest that, overall, these projects had low exclusivity.

Tariff Authority

The degree of monopoly power of the concessionaire, the government objectives, and the level of public (or other stakeholder) interest in the particular mode may determine where the responsibility for setting tariffs lies. Tariffs are a critical component because they directly influence travel demand and mode choice.

The low exclusivity of urban transport suggests that concessionaires have some scope in setting fares, although they can be subject to utility rate regulations. However, because tariffs are such a politically sensitive issue, this is rarely the case. Rather, governments, for example, Argentina with all of its concessions, have negotiated a fixed tariff rate in real terms for the duration of the concession. In other cases, such as with the São Paulo busway concession, the state government was responsible for setting and reviewing the tariff as to ensure "the economic and financial equilibrium of the system".

The political nature of tariffs, particularly in urban transport, often leads to tariff levels that are well below what is considered economically efficient. Subsidized consumption of urban roads is certainly an inefficient and perhaps regressive outcome. For example, the Jaisinghpur (India) toll road concession had the toll levels set in the contract agreement. However, after a public revolt in which users refused to pay the specified tolls, the government assumed the debt with the concessionaires. In this case road users had their consumption subsidized by all taxpayers. In contrast, Argentina's decision to allow road concessionaires to levy tolls earlier than planned can be understood as a choice between using either taxpayer or user fees as transfer payments to the private concessionaire.

Project Risks

Since risks should be allocated to those parties that can best control or manage them, concession proponents argue that better economic outcomes can also be achieved with the risk management capabilities enabled by concessions. The underlying assumption is that both the government and concessionaires know which party can manage risks better and how that is achieved, an issue that is not always the case.

Concessionaires face diverse risks: government policy risk, currency and financial fluctuation risks, technology risks and commercial risks. Government risk is related to the use of policy-making powers to respond to market conditions or to advance social or political goals. Actions at different levels of government may affect the viability of concessions. Changes outside of the scope of the contract, or in the legal and political regime, may have negative effects on the concession. Currency risks are directly associated with the financial market and its fluctuations: exchange, convertibility, currency, and interest rate. Indirectly these risks are influenced by government macroeconomic policy and hence the government has some control over them. Technology risks originate from uncertainty about the building and maintenance costs, and the performance of selected materials and technologies.

The concession features described in the previous section (capital costs, concession period, exclusivity, and tariff authority) directly affect commercial risk, which most analysts consider the greatest risk faced by urban transportation concessionaires. Commercial risk captures the uncertainty of demand for the service or facility provided, assuming that the government provides no revenue guarantees. It arises fundamentally from the uncertainty of estimating future demand because demand forecasting is still quite imprecise, and also because it is linked to economic growth, which is

also difficult to predict.[4] The risk is compounded by the fact that investments are large relative to the size of the market, long-term, indivisible, and location-specific, so that there is limited room for adapting to low demand scenarios. In addition, revenue from user fees or the government are fundamental to provide the liquidity necessary to meet debt from contractual obligations, particularly during the first years if the concession. Therefore, demand forecasts have a strong influence on the financial viability of the project.

Analyzing the State of São Paulo's Busway commercial risk experience helps to partially understand the success of the concession. It is clear that the project was less capital intensive than the other cases, because only part of the infrastructure had to be built (poles and catenary for a part of the busway). In addition, the concessionaire took over an existing service that clearly had proven demand (further supported by the fact that the local government agency, EMTU, required a minimum 15% of gross revenues). This not only reduced commercial risk but also allowed the winning consortium to generate revenues using the existing system, thereby reducing the amount to be borrowed for the capital investments (or facilitate debt financing). Similarly, the relative success of Argentina's railway concessions seems plausible since the funds for the capital investments were supplied by the government, and, more importantly, there was proven demand on the existing corridors.

In the case of the São Paulo Municipal Busway unsuccessful concession attempt, Rebelo and Benvenuto (1997) suggest, that the market felt that the risks involved in building and operating the system outweighed the benefits, and that the Brazilian market is not yet prepared to accept such challenge. Even though a concession agreement was signed, no financier approached by the concessionaires thought that the project was the best use of its capital. Bogotá's concession followed a similar development, with the concessionaire carrying most risks. Again, in both unsuccessful cases, estimating the demand was trickier than in the two successful cases, and the capital that the concessionaire (and its creditors) would have had at stake was much higher than in the two successful transit concessions.

Government Policy Alternatives; Are Risk Guarantees Worthwhile?

Faced with high commercial risk stemming from demand uncertainty, project sponsors may favor the alternative of promoting optimistic numbers to persuade lenders and proceed with the project. Governments can also be in the interest of having optimistic numbers to the extent that it improves the project financing chances and reduces the public sector contributions (Cornwell, 1995). This risk of agency "capture", implicitly documented by Pickrell (1990), is not exclusive to concession agreements but also prevalent in traditional infrastructure projects.

A second alternative to reduce risks is to subsidize the construction and/or operations of the system up-front, as it was intended with São Paulo's Municipal Busway concessions. In theory, this reduces the debt repayment burden to the concessionaire and enables acceptance of higher levels of commercial risk. For example, in the Argentine rail concessions, demand projections were not a major factor in the cost side since the subsidies requested and payments required are not a function of demand. From the revenue side, where the concessionaires undertook the risk, demand on most lines has exceeded optimistic expectations. Therefore, full government financing does not necessarily mean zero revenue risk for concessionaires.

A third government alternative to mitigate risk is to provide in-kind contributions such as land, loans at subsidized rates (soft loans), preferential tax treatment, or direct equity participation. Since most of these options can be valued directly at market prices (and interest rates), they are easier to incorporate in a project's financial and economic analysis than other instruments.

A fourth alternative to reduce risk is to provide government-backed guarantees against the different types of risks faced by the concessionaire. Risk and loan guarantees have become a conventional way of increasing the attractiveness of concessions while apparently make them sustainable for the concessionaire in the long run. The State of São Paulo and the government of Colombia could have very well provided revenue risk guarantees to enhance their projects. Risk guarantees can, not only be quite costly to taxpayers, but also generate incentives that run counter to the original intent of concession agreements. Some of the consequences of the use of revenue risk guarantees merit close attention because governments worldwide are continuing to use them without what appears to be an understanding of the full implications.

Government-backed risk guarantees

Government guarantees may bring undesirable consequences of awarding a concession for an infrastructure project. There is a reduction in the incentives of the private sector market for screening projects, a reduction in the incentive to operate efficiently, and a shift of contractual obligations to future administrations.

If no guarantees are given and a project goes awry, project lenders lose because they will face debt rescheduling in due course. If the government assumes some commercial risk by guaranteeing particular usage levels, the burden is shifted towards taxpayers. Such is the case of the Moscoso Toll Lagoon Bridge in San Juan (Puerto Rico). The government assumed most of the commercial risk by guaranteeing to buy back the project if actual traffic fell short of 80 percent of the projections in the first three years of operations and of 100 percent of projections after nine years. The buyback price included all project costs plus 13 percent.

The consequences of government guarantees indicate that they should be avoided whenever possible. If the real objective of the concession is to raise government credibility on the

government's intent of fostering private sector participation in public sector activities, then interim, not permanent, guarantees can be useful. In fact, the rationale for concession agreements relies on the assumption that risks are diversified amongst the different actors. The various risks are ideally spread among the concessionaire, the users and the government (taxpayers).[5] When the government issues risk guarantees, it is implicitly stating that it can best manage the underlying risk, which is certainly not the case in many instances. If a project warrants considerable government-backed revenue guarantees to be developed as a concession, it may be an economically undesirable concession; the government may be better off by developing the project in the conventional way.

Financial Issues Associated With Government-Provided Risk Guarantees

Guarantees entail an often-overlooked cost to the government. This cost is not explicit, but it is real (Mody and Patro, 1996). When a government provides a guarantee, it incurs a contingent liability, that is, a liability conditional on some future event. This liability risk cannot be diversified through risk pooling because performance of most infrastructure projects is often highly correlated with elements of the business cycle (Klein, 1996a). The fact that a cost may accrue in the future is no reason for anticipating that cost today. Benefits of systematic accounting for liabilities include efficient allocation of resources among projects and fiscal soundness.

However, most governments fail to treat in their budget the effect of providing risk guarantees. A risk guarantee effectively shifts contractual obligations to future generations. Under the prevailing cash-based system of budgeting, only cash outlays are recorded. Therefore, while operating subsidies are recorded the date they are issued, as they should be, risk and loan guarantees are not properly taken into account (Klein et al., 1996b). Guarantees are simply not recorded as expenses unless a future claim is received. The result may be a government's balance sheet with enough contingent liabilities to create serious financial problems. Policy-makers have incentives to provide guarantees rather than cash subsidies, as it lets the fiscal position of the government appear better than it actually is.[6]

The core of the problem is that there is no established methodology for assessing the value of government provided guarantees to projects that have risks that cannot be diversified. The most promising methodology views risk guarantees as a put option. At the end of each period, if the concessionaire's revenues are larger than the guarantees, the option expires worthless. Otherwise, the option is exercised and the concessionaire receives a guaranteed sum. In the simplest case, a guarantee can be measured at the present value of expected future payments. In practice this is quite difficult because future payments are a function of parameters that change over time, such as time to maturity, national and regional incomes, and the like. A dynamic model is need to capture these changes, as in option-pricing. Further, choosing an interest rate for discounting the future payments is challenging. The discount rate should account for the market risk that cannot be eliminated, but no methodology is available for estimating the non-diversifiable risk inherent in commercial risk guarantees of infrastructure projects.

In the interest of providing a practical evaluation of the viability of a single concession agreement, as opposed to a portfolio of projects, Blackshaw, Flora and Scurfield (1992) performed a financial simulation of a Built-Operate-Transfer (BOT) toll road. They compared the BOT project versus a tolled highway built by the public sector and tendered the conventional way. Even after adding 1.5 % to the cost of foreign loans taken by the public authority as a result of government loan guarantees, and without considering revenue risk guarantees, they conclude that there is a distinct likelihood that BOTs will not succeed in accomplishing the assumed objective of reducing the net call on the government budget.

Conclusions

If the use of concession agreements, including financing, construction and operations, to develop inter-urban tollways for financial reasons was questioned by Blackshaw et al. (1992), its use for promoting urban transport projects is even more disputable. The fundamental "disadvantage" of urban transport projects is the high degree of intermodal competition (walk, bus, jitney, transit, etc.) that exists. Even though many urban transport projects can be made exclusive (with geographic considerations such as availability of river crossings, or explicitly targeting long trips), the majority of projects face high intermodal competition. High competition in itself is desirable; if choices are priced correctly, they provide efficient outcomes. However, in the context of concession agreements, high competition makes forecasting future demand more uncertain, and hence it significantly increases the level of commercial and financial risk. Argentina and Brazil's successful concessions leveraged the existing demand on the corridors to decrease commercial risk against a low level of capital support.

Package Features

Successful financial closure of a concession agreement is closely related to characteristics of the concession package. The case studies showed the intricate interdependencies among capital investment required, the concession period, exclusivity and the level of commercial risk. Projects with considerable investment support required by the concessionaire, long payback period, and high revenue risk, such as Bogotá's busway program, are more difficult to finance than projects that require small capital and a shorter payback period. The successful concessions studied reached a balance by having relatively low concessionaire's capital requirements while incorporating some degree of commercial risk.

It is plausible that the success of Argentina and São Paulo's State concessions are a result of private sector efficiencies in

operating public transport and implementing capital projects, and being uninvolved in substantial capital funding. In contrast, Bogotá's and São Paulo's Municipal unsuccessful concessions simultaneously targeted private sector (assumed) capital and operating efficiencies by requiring high levels of capital involvement and high levels of commercial risk. It may be sound to further explore the realized benefits or costs of having private sector funds in the development of public infrastructure to test if the distinction between capital and operating efficiencies holds.

The cases had small variations in the level of government policy risk; therefore, the findings are applicable to countries with relatively stable macroeconomic policies comparable to the countries contained in the cases. Most of Latin American countries would classify under this rubric. However, as suggested by the transport concession experiences in Indonesia and Malaysia, government policy risk remains an important variable that should not be overlooked.

Finally, the overall availability of debt and equity finance is critical to project success. This is particularly important for developing countries because they have been suffering from a long-term credit financial squeeze. A shortage of funds means that governments will not invest in projects that would otherwise have been developed had there been a sufficient amount of capital available. Underinvestment has detrimental consequences for future economic growth. It is clear that, with or without concession agreements, support from export lending agencies and multilateral financial institutions is still warranted.

Government's Role

The importance of government intervention with clear objectives and determination for piecing the concession process together is evident. It is commonly thought that a government has fewer decisions to make when promoting a project via concession agreements than with a conventionally tendered project. The opposite is true. A government has to create an adequate framework and climate that are critical to a concession's success. Governments should continue to select projects that are economically viable in the long run as potential concession candidates.

When should guarantees be offered? Since governments rarely, if ever, compute the real price of a concession, it is difficult to make an informed decision on this central question. The first step is to attempt to value the guarantee and treat it as a variable in the project's economic analysis. In that way, the risk of treating private sector participation in infrastructure as a mechanism for bypassing a national budget is eliminated. With guarantees, a government eliminates the need for recurrent financial and managerial support, but in the process may retain the ultimate financial liability. Governments are effectively swapping what is potentially a recurrent liability with a contingent liability, as concessionaires often can find the option to sell back the concession to the government or demand compensation when revenues do not match expectations.

Notes

[1] A note on terminology; the term successful concession is used to indicate a concession that was awarded, financed, and undertaken without regard to the economic, financial, or operational consequences it entailed. When the term "unsuccessful concession" is used, we refer to an unsuccessful attempt at developing a project through a concession agreement because the project did not reach financial closure.

[2] The Medellín metro was a fiscal disaster for the Colombian government. The system was estimated to cost $US 0.6 billion in the mid 1980s; by 1994, costs had escalated to $US3.0 billion (real dollars). The system successfully began operations in 1996; a concession for the entire operation of the system and the construction of an extension is currently being considered.

[3] Mexico's inter-urban road concessions are a prime example of why the concession period is not a measure of risk (and in fact, concession period can be considered as endogenous to the concession). The Mexican government's bid award criteria was the minimum concession period proposed. Not surprisingly, bidders assumed outrageously high tolls, asked for revenue guarantees and minimized on the concession duration. The consequences of Mexico's concession design are well known.

[4] For an comprehensive analysis of the errors of demand forecasting in mass transit systems planning in the US see: Pickrell, Don H. *Urban Rail Transit Projects: Forecast versus Actual Ridership and Cost* U.S. Department of Transportation, Washington DC, 1990.

[5] The Sydney Harbour Tunnel is a case where the government made substantial grant contributions, and revenue risk guarantees based on projected traffic. The concessionaire only undertook construction and technology risks. Mills (1991) characterized the Sydney agreement as one in which "the company is but an agent of the government...which bears most of the risks and pays all of the costs".

[6] Some countries have changed its budgeting and accounting systems for guarantees in order to record more coherently the actual costs of the instrument. The US made the changes in 1990; Canada followed shortly after. New Zealand passed fiscal responsibility act in 1994 (Mody and Patro, 1996).

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