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Public-Private Partnerships in Highway Constructions: Theories and the Hungarian Practice

Public Private Partnerships (PPPs) exploit the fact that both the public and private sectors have certain advantages relative to the other in the performance of specific tasks. By allowing each sector to do what it does best, public services and infrastructure can be provided in the most economically efficient manner.

The major challenge state and local transportation officials were facing was the shortfall in financial resources to respond to increasing needs. The problem is worsening by competition for funds amid government and broad public resistance to tax increases. Private sector capital is welcome in these situations, sometimes without considering other consequences of the partnerships. Experiences from the transport and other sector show us, that unforeseen costs arising from re-negotiations may in some cases override the benefits of PPPs.

In the following section, I demonstrate with Hungarian experiences that among the potential benefits a few were realised in major highway projects. In the second part, I present the possible economic advantages of PPPs. I believe, contract structure has great impact on the exploitation of the efficiency of private sector. That is why in the third section I address the question: To what degree can the government achieve efficiency in different contractual environments? Finally, section four concludes the paper.

1. Private sector participation in major Hungarian highway projects

M1 private toll motorway

The M1/M15 project was the first toll motorway project tendered and implemented in Central Europe. By the end of 1991, financial and legal advisors to the Ministry were appointed and a pre-qualification procedure was started. Out of the four international groups invited to submit bids in August 1992, two groups were invited to negotiate in parallel the concession contract and the results thereof materialized in the submission of improved bids (January 1993). On the basis of these bids (taking into account the construction price, the toll rate and the proposed financing package including the commitment to provide equity), one group was nominated as preferred bidder and negotiations were concluded in April 1993 with the signing of the concession contract.

The project was wholly funded by the private sector (80% debt and 20% equity), the government did not make any financial contributions. The debt was provided by EBRD combined with international (USD and DEM nominated) and local (Hungarian Forint nominated) commercial debt in an “A & B-type loan structure”. Standby loan facility was available (€ 50 million). Loan maturity was 14 - 15 years.

The state was responsible for the provision of land for motorway construction, and made commitment regarding the restriction on construction of parallel competing roads.

The toll rate was set in the tender documents with a formula for maximum annual toll increases, depending on local inflation and exchange rate developments. Initial toll rate based

on “revenue maximization principle”. Given the high level of foreign and occasional traffic and the existence of only one toll barrier between the border and Budapest, traffic studies indicated that a relatively high toll could be charged.

Following a successful tender and financing, construction was largely completed on time and within budget even though the construction period was ambitious and Hungary underwent a period of high inflation. However, all traffic projections prepared by the Ministry, the investors and the lenders were far too optimistic (traffic in 1996 was only approximately half of that forecast on which the financing was based). M1 traffic at opening and traffic growth during the first three years was substantially below expectations, resulting in the impossibility to service debt. Level of toll rates turned out to be politically unacceptable and a court case made the financial situation untenable. Attempts to restructure company finances, starting with the issue of letters of credit by Government and shareholders, remained fruitless. Government and lenders agreed however on a substitution process after three years of operation (September 1999).

M5 toll motorway

The government signed the concession contract regarding the building and operation of the M5 motorway in May 1994. As in the case of the M1 motorway, the M5 was built using private capital (78% debt, 22% equity). The loan was backed by the future toll revenue during the 35 years duration contract.

The contract was amended in December 1995, before the beginning of construction, when the loan contracts were signed. The project company obtained minimum rate-of-return guarantee after its investment. As the traffic forecasts turned out to be optimistic, and toll revenue was not enough to cover the interest payments, the content of this amendment became binding from the opening of the highway.

Until 2004 the government paid significant amount of warranty to cover the losses (see Table 1). This had driven the cabinet to another renegotiation phase. In 2004 the state bought 40 percent of the concessionaire’s equity, and agreed to substitute its toll and warranty revenue with availability payment.

Table 1: Subsidies and toll revenue ((€ million)

Year	Subsidy	Revenue
1998	3	0
1999	10	21
2000	12	28
2001	15	25
2002	6	32

Although private capital made it possible to build the M5 when there was not sufficient budget resources, the underutilisation of the motorway undermined this advantage. This served as a lesson for the decision makers that state should retain its privilege to determine the toll level.

M6 PPPs contract

The currently signed M6 motorway lease contract shows the government intention to seek for innovative concepts. The 59 km motorway section will be built under the so called lease contract. The private concessionaire finance the construction during the two years period. After that the government will pay for the service an annual availability fee for 20 years. The present value of this payment is 508 million Euros, 90 percent of that is loan provided by financial institutions.

The lenders bear significant financial risk: in case the concessionaire cannot maintain good service level, the motorway becomes state property without paying the subsequent availability payment.

Table 2 shows the summary descriptives of major Hungarian privately financed highway projects. We can conclude that private capital made it possible to build motorways in a period when general budget had insufficient resources. The motorways were built ahead of schedule and within the budget. However, large proportion of drivers did not use the new roads, so the economic benefit of the projects was questionable. Moreover, the overwhelming use of guarantees put significant pressure on the general budget in subsequent years.

Table 2: Description of private financed motorways

Project	Length	Construction period	Form	Project value* (€ million)	Equity to debt	Renegotiation
M1 Győr-Austrian border	43 km	1994-95	Tolled	280	20%	Buyout
M5 1 st phase	90 km	1996-98	Tolled	351	22%	Refinancing, PPP from 2004
M6 Érd-Dunaújváros	59 km	2004-06	PPP	508	10%	-

* current prices

2. Reason for PPPs

The efficiency perspective

Private sector participation expected to result in cost saving to the government. In this part, I highlight the financial benefits associated with innovative contracting methods.

Construction Cost Savings: Combining design and construction components under one private partner can result in savings through a fast-track construction schedule, faster procurement, lower interim financing and lower risk of delay.

Faster Implementation: By dealing with fewer service providers, combining the design and construction, reducing procurement time, and accelerating capital financing, required services and infrastructure may be introduced faster, and thus, cheaper. Since large cost overruns are associated with projects with long construction periods [1], fast implementation means a reduction in the risk of cost overruns.

Operational Savings: In some cases, private partners are able to reduce operating costs

through operating multiple facilities, specialized technology, sharing specialized labour, more flexible compensation arrangements, bulk purchasing, and centralizing the administrative staff. These savings are often enhanced when the private partner is involved at the program or infrastructure design stage.

Innovative Solutions: Competition encourages potential private partners to search for creative ways to deliver a particular service more efficiently than their competitors or the government itself.

Risk Sharing: Under traditional practices, governments bear all risks associated with service delivery. PPPs allow the transfer of some of this risk to the private partner, such as that associated with liabilities, cost overruns, market fluctuation, ongoing maintenance, regulatory compliance, etc

Financing Options: While the government generally has access to lower-cost funds than those available to the private sector, it is restricted to a limited line of investment vehicles. The wide range of financing options (e.g. both debt and equity markets), and the flexibility available to the private partner (i.e. the ability to periodically refinance debt or use financial innovation) may, in some cases, reduce the cost of capital for a particular project.

Enhanced Economic Development: PPPs give the opportunity to implement economically desired projects through private financing well before it is possible to finance from state budget.

The government faces trade-offs when it tailors appropriate PPP contract. The most relevant may be the one between competition and the scope of the contract. The broader the scope of tasks, the weaker the competition. The number of contractors who are able to manage large contracts is relatively low; so there is not much competition in this market. Moreover, the general contractor may have a dominant position towards the subcontractors and may take unfair advantage of this. When the scope includes operation, competition in the market place is also altered and the longer the contract, the greater this risk. Containing this risk is an issue for the contractual framework and the regulator.

Off-budget-sheet treatment

The starting point of an economic analysis of PPP is the manner and extent of risk transfer between the general government and the private sector, as it provides a basis for deciding whether the relevant investment is public or private in the economic sense.

With respect to the budget classification applied in the United States, the Congressional budget Office (CBO) singles out six considerations to be used as criteria for recognising PPP projects in the private sector [2]. In case of fixed investment, risks are actually transferred to the private sector if

- the fixed asset serves general purpose (it is not specified by the government),
- the fixed asset has a market also in the private sector,
- during the term of the contract, the private partner has ownership title to the asset, which is not transferred to the government subsequently either,

- the contract does not stipulate a bargain-price purchase option,
- the contractual term does not exceed 75% of the estimated economic life of the asset,
- the present value of the minimum rent payable during the contractual term may not exceed 90% of the fair market value at the beginning of the contractual term.

The Eurostat requirements applicable to the EU Member States use different considerations to establish whether PPP projects should be recognised within general government or not [3]. The currently effective Eurostat regulation, which specifies earlier considerations, examines whether

- the private sector bears the construction risk, and
- at least one of either availability or demand risk.

If neither is the case, the PPP is considered to be a financial lease, i.e. a below-the-line transaction; thus irrespective of its legal framework, the project must be reincluded in the general government accounting. Construction risk covers things like late delivery, additional costs and external negative effects. Availability risk covers problems of performance, such as problems with the quality, volume and safety standards in the provision of services. Demand risk covers variability of demand irrespective of the behaviour of the private partner. According to the IMF view, this recent Eurostat decision gives considerably cause for concern, because it is likely result in most PPP projects being classified as private investment. From the perspective of fiscal consolidation, one of the most conspicuous differences between a PPP scheme and traditional public fixed investment is that the former considerably changes the time profile of expenditures recorded in the general government. In the case of traditional public fixed investment, expenditure arises at the beginning of the term (first large fixed investment and then operational and interest expenses), whereas under PPP scheme the entire expenditure is spread over time. In consequence, though in the initial phase it results in savings for the budget, later it generates continuous additional expenditure.

Hence, in the year of switching to the PPP scheme, government expenditure is cut, as no initial fixed investment expenditure arises. Later on, however, this may give several problems. One is that future budget becomes less flexible.

On the other hand, we could see through the cases of the M1 and M5 motorways that the extended use of warranty and renegotiations has similar effect on future budget. Since these implicit subsidies are hard to measure, they may be more dangerous from fiscal perspectives. The government initiated highway projects when they were financially not feasible and the budgetary treatment were more stringent.

3. Effects of contractual environment

Excluding in-house provision of highway infrastructure government should deal with new types of problems. The most important one may be the cost of moral hazard. The government can not precisely observe the contractor's cost and profit requirement, that is why the contractor can expect some rent for his private information. This can take place in several form depending on the contractual relationship. During the tendering procedure the winning bidder can directly earn some rent by submitting higher offer price than his reservation price (the price when the contractor is just indifferent between getting the contract or not). Once the

contract is awarded, under minimum return guarantee the firm can misreport costs or he might not undertake efficient initial investment to reduce maintenance costs in the future. The government of course can specify the work in details or invest in cost audit in order to reduce these costs.

When the cost uncertainty is borne by the state and the contractors are competing in their profit requirements the government might not choose the cost efficient firm. Bidders with high cost and low profit requirement might be selected. This phenomenon is called the adverse selection.

In the following example we will see how different contract types perform in the world of imperfect information.

Suppose that the competing contractors' reservation prices are uniformly distributed: $P \sim U(100,120)$. As the construction cost of 1 kilometer highway in Hungary is about € 10 million, we can interpret the example as a tendering of a 10 kilometer highway construction project. The distribution of the minimum profit requirement (or normal profit) is $\Pi \sim U(10,20)$. Suppose that the distributions of P and Π are independent. Under fixed price contract the lowest offer price wins. Under minimum profit guarantee the lowest required profit wins, and government bears the cost uncertainty.

Table 3 shows the expected results for two cases: two or three companies are present in the competitive bidding¹.

Table 3: Expected results of the tender (expected values)

Price elements	2 bidders		3 bidders	
	Fixed price contract	Minimum profit guarantee	Fixed price contract	Minimum profit guarantee
Offer price	113.3	113.3	110	112.5
Cost	91.7	96.7	90	97.5
Normal profit	15.0	13.3	15	12.5
Information rent	6.7	3.3	5	2.5

Notice, that there is a trade-off between selection error ($5=96.7-91.7$ and $7.5=97.5-90$) and information rent. Minimum profit guarantee reduces uncertainty for the concessionaire that is why information rent is lower. On the other hand, fixed price contract is always awarded to the low cost concessionaire, but minimum profit guarantee results in adverse selection. In this setting, as competition – the number of bidders – increases the fixed price contract become more advantageous. Profit guarantee is preferable if the variance of profit requirement is high and the variance of cost is low.

The M5 (1995) highway is not a clear example of competition in profit requirement because minimum return was negotiated. Although competitive tendering was not taken place in that form, contractors could have built the ex post renegotiation in their expectations, thus the competition could be similar ex ante. Consequently the possibility of adverse selection could be present, a bidder with the least expected return and slightly higher cost than the others could have won the contract.

As a general rule, the broader the scope, the lower the overall costs of the infrastructure – even if initially, the cost may appear higher, for the contractor is responsible for more tasks

¹ Derivation of the bidding strategies and revenues in an auction with uniformly distributed private values can be found for example in Krishna [5]

and bears more risks than in the case of the traditional approach – thanks to streamlined procedures and enhanced cooperation. This positive externality across the different stages – building, maintenance, management – can make PPPs more efficient than conventional procurement (Hart [4]). However, as we saw above, return guarantee – like in the case of M5 motorway – can undermine this effect by cutting off firm's incentives to reduce costs.

4. Conclusion

During the 90's the government could extend the highway network through implementing private toll roads. This practice has adverse effect on both economic benefit of the highways and the subsequent budget.

The changing treatment of government debt has a double-sided effect. Firstly, replacing traditional public fixed investment with PPP schemes can further increase future fiscal instability. Secondly, using PPPs instead of giving guarantees – and other implicit subsidies – to private toll road operators can reduce the risk of renegotiation. Although fiscal burden still seems to be the dominant reason for applying PPPs, innovative financing solutions can improve overall efficiency.

PPPs in Hungary had poor performance: public agency that manages the public highway network, had lower maintenance cost than the consortium that manages the M5 highway. In addition the government guarantees relatively high return (14%) to the shareholders of the consortium without transferring any market risk.

However, PPPs seem to survive and the government plans to expand private sector involvement in the future. Setting limit to off-balance-sheet treatment might be favourable to prevent government from myopic behaviour.

5. Bibliography

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