A NEW APPROACH TO THE MANAGEMENT AND FINANCING OF ROADS: A Vision for the Future

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1. INTRODUCTION

The problem

Roads are normally managed and financed within the public sector The experience of public management and financing of roads is mixed. The following problems have been noted[1]:

- annual appropriations will be uneven and insufficient;
- road management may not be guided by the public interest; and
- road management will be inefficient on account of poor methods for effecting accountability.

Whilst these problems often are highlighted, there is a further - less noted - problem, viz. that the contracting industry involved in road construction and maintenance shows a low level of innovation[2]. Ultimately this reflect the condition that the industry spends little on investment in research and development.

The shortcomings of the present arrangements have led to new approaches being introduced in some countries. The most innovative country is New Zealand, where a self-financing system for the entire road sector has been introduced by way of road user charges. The public road manager[3] in that country has also reduced its role to only include overall planning, contracting and overall contract management, whilst all maintenance and construction activities, as well as a substantial portion of regular planning and supervision activities, are contracted out.

A number of other countries has made use of the concession approach, whereby - normally - private interests are given the right to develop and operate parts of the road network for a specified time period. Concessions can be seen as an example of a new procurement method in the road sector. Another example of a new procurement approach, which has been developed in recent years, is characterised by that the road manager does not pay directly for the investment - as in a traditional procurement - but for the

[1] World Bank [1994].
[2] Vägverket [1995].
[3] The words 'road manager' refer in this paper to the entity legally responsible for the management of the road network, irrespective of whether it is part of a ministry or a public agency of sorts.

service that the investment yields over future years. This new type of procurement method thus entails a kind of instalment payment by the road manager to the contractor during a given number of years subsequent to the new road having been completed; it has recently also been introduced for maintenance projects.

A variant of this new procurement method for investment projects has been developed in the UK where it is referred to as Design Build Operate and Finance (DBFO), and hence also includes the design component of the project. A characteristic of the UK approach is that the payments made by the road manager to the contractor is in the form of shadow tolls, i.e. the payments vary with the amount of traffic recorded on the road in the future.

The vision

It is argued here that recent attempts at reforming the road sector in various parts of the world reflect a growing realisation that it is necessary to improve its efficiency, and to make it more dynamic. It is also argued here that the attempts at road sector reform which can already be observed are not to be seen as isolated phenomena; they may be seen as harbingers of what is to come during the 21st century.

The vision of the future arrangements in the road sector comprises four building blocks:

1. Self-financing by way of road user charges. The current system in New Zealand, whilst not being a perfect model, at least serves as a harbinger of what is to come. New Zealand is one of very few countries in the world which has implemented road user charges, mainly based on a fuel charge and an annual licence fee. Large and heavy vehicles pay a weight-distance charge which varies with the size and weight of the vehicle.

2. An independent agency for managing roads subject to oversight by an independent regulator. The future road manager will likely operate within an institutional framework similar to that of a state agency, but with considerable independence from the state and subject to clear accountabilities. The performance requirements imply that the road manager must strive to attain the goal of economic efficiency. The road manager will only be involved in key functions as concerns planning, procurement and contract management. The best example of what is to come is Transit New Zealand, the road manager in New Zealand. The function of the regulator is primarily to ensure that the road manager strives towards economic efficiency in his operations, and that road user charges are also set so as to promote economic efficiency and equity. As concerns the role of regulator, the best harbinger is the Road Fund Administration, which was established in Namibia during 1999.

3. Procurement of works based on output specifications. Road works will be performed by private contractors. However, the current types of contracts which typically are based on input specifications, will be replaced with contracts entailing output specifications.

4. Payment to contractors based on performance as measured by output specifications. Payments are today normally made when the contractor is delivering the inputs required by a works contract. In the future, contractors will be rewarded for delivering a service meeting specified standards (i.e. the output specifications). The new procurement method in the UK referred to above may be seen as one of the first applications of this principle on investment projects in the road sector.

In order for this vision to materialise, it will not be necessary to put all the four building blocks in place at the same time. Building blocks one and two go together, and in the same way it may be argued that building blocks 3 and 4 can be seen as the two sides of the same coin. It may also be argued that there is - albeit a weaker - relationship between building stones one and two, on the one hand, and three and four on the other. It is thus likely not possible to more regularly apply the new procurement approach that would be introduced by building blocks three and four unless the institutional arrangements in the sector are also reformed. The application of output specifications linked with paying for outputs on a regular basis requires that the road manager is characterised by a high level of professional standard and that the long-term financing needs of the sector can be secured by way of road user charges.

The remainder of this paper will now present an outline motivation for the relevance of the four building stones. The next section - Governance - will focus on the overall institutional arrangements and the fundamental financing arrangements, i.e. building stones one and two. Section 3 - Procurement - then covers building stones three and four, and this will be done by reviewing the new procurement method for road investments recently introduced in the UK.

2. GOVERNANCE

Introduction

A question that must be asked before considering road sector reform is why practically all countries in the world operate the road sector as an integral part of the public sector[4]. Whilst the short answer to that question appears to be that it has been difficult to establish functioning operational objectives and effective regimes for enforcing accountability in the road sector, there are more fundamental reasons. Two of them are particularly important. The first is that roads are not perfect economic goods; they have characteristics which give rise to so-called market failures. The second is that road investments and maintenance activities have important distributional consequences.

The reasons for the special economic nature of roads are diverse. One of the problems stems from their cost structure, i.e. that they are characterised by economies of scale and scope, and that investment expenditures are basically to be seen as sunk costs. A second problem is that a road service is not produced by the road alone; it is produced jointly by the road, the vehicles, and the drivers and passengers of the vehicles and/or the goods carried. The costs of these three elements are not independent, and all investment and maintenance activities hence have important effects on parties 'external' to the entity responsible for managing the road sector. A third issue is that the available evidence indicates that the price elasticity of road use is low reflecting that road users often have limited opportunities for using alternative means of transport. A road is thus not only a natural monopoly from the point of view of the road sector, but also when placed in the context of the entire transport sector. Finally, it is noted that roads - at least in part - take on the shape of a public good in that they are characterised by non-excludability (one cannot prevent someone from consuming it), and non-rivalry (the consumption by one person does not reduce the supply available to others).

[4] An additional characteristic of current arrangements is the low level of road user involvement, although some schools of reform now put heavy emphasis on stakeholder participation. See e.g. Heggie [1995].

These economic characteristics of road services can be seen as economic efficiency reasons why the road sector is normally not managed in terms of the profit criterion or on commercial terms. However, as anyone who has been involved in the road sector can testify, also the principle of economic efficiency actually tends to play a limited role in guiding road planning and maintenance at present. One important reason for this is the distributional consequences of investments in roads and maintenance activities.

In developing countries as well as at the local level of less-developed regions in developed countries, the distributional impact takes on a further dimension. Roads are then often seen as a means to ensure that access is provided to everybody, at least so that the citizens may have access to basic social services such as health care and education.

An alternative to the present approach

It is, however, not necessary to view the presence of a market failure as an argument for public ownership or control *per se*. The market can itself deal with such problems and in a way that is compatible with economic efficiency. And that also applies to infrastructure. One example of such a solution is when consumers decide to provide and operate infrastructure on their own. There are many examples of such arrangements - by way of associations - for providing roads, water and sewerage in local areas.

A specific example is the road associations to be found in Sweden. They may be viewed as an application of what the economist would call the 'club model' for the provision of a service. A club is characterised as a voluntary organisation which is operated by its users for their own benefit and paid for by them. A specific feature of the club model is that the club itself only provides for certain facilities, whilst the members then make use of these facilities in order to produce the final result, i.e. the service demanded by the members. These conditions are very similar to those which apply to the road sector.

Why then not use a club approach to the operations of the entire road sector? It is argued here that the concept of a club is relevant and useful in order to understand the issues to be addressed and the potential for alternative organisational structures in the road sector to the present one. To see this it is necessary to make use of the results which have bee derived from applying economic theory on the club concept[5].

Under certain conditions it can thus be shown that clubs are compatible with an efficient state of the economy. Clubs can therefore be an effective way of dealing with a number of problems which occur in a completely private economy, including indivisibilities, public goods and economies of scale. It can also be shown that clubs can be an effective way of dealing with congestion problems arising out of the joint and simultaneous use of facilities.

Some of the conditions that must be met are:

- there must be a competitive or a contestable market for the output of the club;
- it must be possible to separate members from non-members to be able to impose membership user fees; and
- the members of a club must be similar

[5] See e.g. McGuire, 1987.

It is clear that for the public road network in general, all the three conditions are violated, in principle. The main problem is that public roads, as mentioned above, are natural monopolies. In addition, the third assumption is violated in that the road club would not be homogenous. There are basically two issues. The first is that there are several types of users, e.g. the truckers and those driving cars, and the second is that some users are only interested in one part of the network, whilst other users may only be interested in another part.

The road system can therefore be said to be characterised by 'club market failure'. The implication is that delegating responsibilities for the road network to road users cannot normally be expected to result in an outcome that is to be viewed as compatible with economic efficiency. However, this does not necessarily mean that the public sector must take over. There is an alternative, i.e. to appoint an agent. The agent would manage the road network on behalf of the road users and in their interest, as if it were a club. It may be argued that the raison d'être of the agent is to ensure that there is effective - operational - representation of the interests of the road users. The corollary is that the role of the public sector is to establish a regulatory framework to ensure that the agency arrangement actually functions, i.e. that the agent operates the road network in the interest of the road users.

By observing recent reforms in the road sector involving developments towards a kind of club structure based on an agency arrangement, the following regulatory and governance framework may be identified:

- the agent must operate in terms of an explicit objective function, and this objective should be economic efficiency,
- the agent should not be given any other tasks but to manage the road network,
- the agent must act within a governance framework which is similar to the one applying to private companies or associations,
- there is a need for a regulator, to ensure that the agent follows the rules of the game. To promote effective regulation, the regulator may be bestowed with the power to control the monies required by the agent; the regulator would thus only release monies to the agent for the operation of the road sector provided that he is convinced that the agent follows procedures compatible with efficiency; and
- full transparency of the work of the agent and the regulator to ensure overall supervision by the road users.

The above arrangements largely correspond to the institutional arrangements found in New Zealand and being put in place in Namibia. In both these countries, specific legislation has been enacted to establish the agent and the regulator.

The funding of roads

The governance framework is not complete, however, without considering the financing of the road network. It is argued here that there are a number of strong motives for self-financing - to be achieved through the imposition of road user charges - which are basically economic in nature. The most important of these is that self-financing is intrinsic to the club approach, including in the variant of the club model advocated here, i.e. by using an agent to act on behalf of the road users. The club is to be operated in the interests of the road users, and the only way to establish that this is actually being achieved is by testing their willingness to pay. Also, unless road users pay directly for the services they receive they will not have

the incentive to monitor the agent (as well as the regulator). Self-financing is the glue that makes the different parts of the system stick together.

Self-financing is, in addition, required in order to overcome the problems associated with operations in terms of appropriations, as referred to in the introduction. The public expenditure system is on the whole not appropriate for the financing of infrastructure, which requires long term commitments.

Self-financing, of course, does not rule out that roads may be built and maintained to consider distributional effects. As for other sectors in the economy, it is possible to combine a self-financing system with specific subsidies for certain activities which are viewed as justified on social grounds. This approach has the added advantage of ensuring transparency, i.e. to provide information to the public about the costs of (the subsidies for) public service obligations.

Self-financing is, however, not sufficient; there is also a need to be quite clear about the approach to be used to the design and setting of road user charges, and the point being made here is that the club approach may be employed also to solve this problem.

The debate on road user charges typically take the marginal cost concept as a starting point. The approach advocated here puts the road users' demands in focus in lieu; the starting point of any road user charging system should therefore be that it must be designed so that it is seen as acceptable to the road users. In the absence of a real possibility to establish what road users would be willing to pay - as they, given the circumstances, have no incentive to reveal their preferences in this regard - economic game theory may be used in order to establish certain principles. Assume for simplicity that there are only two types of users of each road, e.g. truck owners and car owners. Game theory then suggests that these two groups would, in principle, be able to develop a pricing structure on their own and through negotiations, fulfilling a number of conditions including that (i) each category of vehicle would pay at least the incremental cost associated with that type of vehicle; (ii) no vehicle category would have to pay more than the stand-alone cost associated with the provision of road services for each vehicle category; and (iii) the total revenues would recover total costs.

The two first conditions can be seen as the conditions of fairness. It may be argued that both of these conditions must be fulfilled in order for the two categories to accept the pricing structure at all. A pricing structure that satisfies all three conditions is called efficient. It can be shown that (given certain other conditions) it is possible to identify a set of price combinations which meet all three conditions and which therefore are efficient[6].

It may further be argued that one approach to satisfying the three conditions would be to set road user charges so that each user pays his marginal cost, and that all fixed costs not recovered through such a marginal-cost based approach are allocated to road users in terms of the benefit principle. Assuming that benefits are proportional to road use - which seems reasonable - implies that road costs should normally be recovered through instruments that are a function of distance, including weight/axle-distance charges and surcharges on fuel, but not through a vehicle licensing scheme. The implication is that road user charges which have been set so as to recover marginal costs for different vehicles, should be adjusted upwards so as to also provide for the recovery of the fixed costs.

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[6] See e.g. Littlechild and Thompson [1977] and Brown [1985].

Concluding words

The most important feature of the envisaged new institutional arrangements is that it recognises a third party, the road users. Ultimately, the road sector is for their benefit so why not involve them to a much greater extent than hitherto.

The argument made here is that this can best be done through an agency arrangement, in which a central feature is the explicit requirement that the sector be run in terms of the economic efficiency principle. The implication is that the public sector will have to play the role of the regulator, but also to act as the facilitator to ensure that the agency is established and becomes operational.

The new party, the road users enter the scene primarily as the overall monitor of the arrangements. The road users must be consulted and they must be able to protest. And to ensure that they do so effectively, they will have to pay the costs of running the road sector through road user charges. The new approach to governance also allows for the formulation of certain principles for the setting of the road user charges. These must be acceptable to the road users, and as a consequence they must be set so as to recover marginal costs, but also adjusted to take into account the benefits that different road users derive from the road system. Road user charges should therefore always be function of distance, and not be paid in fixed amounts.

3. PROCUREMENT

Introduction

The last two building stones entails the introduction of a new form of contracting by the road agent with the private sector. The advantages of the new procurement method will be analysed by focusing on the new method for procurement of road investments developed in the UK, referred to as DBFO, which is the harbinger of what is to come. However, there is a need to consider both the appropriate structure of the contract as well as the payment arrangements under the contract. It is contended that the present arrangements as concerns DBFO as this procurement method has evolved in the UK are not always appropriate. The continued presentation is based on the assumption that the road manager wishes to undertake a road investment, after having verified its viability by way of a cost-benefit analysis.

When applying DBFO, a new role player appears, i.e. the financier or the capital market. The role of the capital market is, *inter alia*, to raise the capital required subject to competition and risk taking. In the UK the contractor carries the risk that the project may take longer to implement and/or will cost more than anticipated. Repayment is not commenced until the road has been opened to traffic and no compensation is paid for cost overruns. If DBFO is combined with payments in the form of shadow tolls, the contractor additionally caries the risk on account of that the total payments will be determined by the total future volume of traffic.

The first question to be addressed is why DBFO contracting can contribute to reducing the economic costs of the project when seen in a life-cycle perspective and/or may result in increased economic benefits. The short answer to that answer is that DBFO - when properly structured - allows for competition in risk management as DBFO forces contractors to take on substantially higher risks. A second question to be considered is therefore how the risk transfer should be accomplished and a third question concerns which types of risks that should be transferred. To consider these questions further, the next section, will review the importance of risk from an economic point of view, including how the cost of risk may be analysed and considered when implementing a road project.

On risk

Building a road always entails risks. Firstly, it is not possible to fully forecast the construction costs. Future maintenance costs are partly determined by future traffic levels and their composition. And also the future economic benefits are uncertain as they are largely determined by the future volumes of traffic.

From an economic point of view, uncertainty must be taken into account. The reason is that people in general are risk averse, which means that risks give rise to an economic cost. It may be shown that the risk cost associated with a project comprises two components, the cost for the specific risk and the cost of the market risk[7]. For an investment in a road, the market risk primarily reflects that future traffic is uncertain, whilst the specific risk primarily may be seen as associated with the investment itself.

The implication of risk is the same from both a private and a societal perspective. Risk spreading signifies both in the context of private and public financing of a project that the cost of the specific risk component can be reduced and even eliminated. It may be argued that public financing in effect is a better instrument to reduce the cost associated with the specific risk. The private sector has, on the other hand, under appropriate conditions much stronger incentives to select cost-effective methods for building and maintaining a road than the public sector. These incentives reveal themselves in a more active search process for information about probabilities of events and the cost implications of these events, with the purpose of trying to change these events and/or reduce their cost implications. It is in this way that the private sector is better at managing risks, but ultimately this strive is dictated primarily by a desire to reduce costs *per se*, and not by the condition that the private sector is better at actually reducing specific risk costs. With the concept risk management as used here is thus primarily meant the process of reducing overall (expected) costs.

Why?

What has been referred to above as risk management must be seen in the light of different types of contracts in the road construction and maintenance industry. Four basic types of contracts may be identified in conjunction with constructions works, ordinary build contracts (B), design and build contracts (DB), design, build and operate contracts (DBO), and DBFO-contracts. A build contract presupposes that the design has been prepared by the client (by himself or by engaging a consultant). This is the normal contracting format in the world today. A DBO contract comprises a maintenance phase. In a DBFO contract, the contractor also has to mobilise the finance in order to carry out the project, and the contractor is not paid by the road manager until after the road has come into operation; under the other contract formats the contractor is paid when the works are executed.

[7] Cf. Brealey & Myers [1991].

Contracts may also be distinguished by whether they are based on input or output (or performance) specifications. An ordinary build contract is based on input specifications. A DBO or a DBFO contract is supposed to be fully output oriented. However, so far there are few examples in the world of construction contracts of this kind, and even the DBFO contracts which have been let in the UK have so far not been genuine output specification contracts. Genuine output specified contracts are much more common in connection with road maintenance.

Input specifications imply that the contractor in effect cannot chose the construction technique or materials; how the road is to be built is stated in the design which is part of the contract. Procurement in terms of an ordinary build contract thus leaves very little scope for competition as concerns risk management. This contract format is also the reason behind the low level of innovation in the building industry, as it does not leave much scope for the introduction of innovation in order to affect risks or to reduce costs. However, it is not only the use of input specifications which stifles development. Whilst normal procurement procedures allow tenderers to submit alternative tenders, based on other techniques, there is no incentive for contractors to do so. If a bidder were to submit a tender involving a new technique he runs the risk that the client will gain access to this new technique and hence also his competitors. There is thus no scope for a contractor to invest in development work, which normally requires that he can recoup his investments through a number of projects.

A further complicating factor is that a new technique might result in lower future maintenance costs but at the expense of a higher - initial - investment cost. When evaluating bids for build contracts, the total life cycle costs of a road are normally not taken into account.

Contracting using output specification have been developed to remedy these shortcomings of the traditional contracts. There is, however, yet another motive for contracts based on output specifications, viz. that they allow projects to be implemented much faster than for a normal contract. In a traditional contract, the design is prepared first, tendering is then undertaken before building may be initiated. In a output-based contract it is possible to undertake design and actual construction works at the same time, which allows for significant time savings[8].

The basis for a output specification contract is that the road should meet certain performance specifications - road space characterised by measurable functions - which are demanded by road users. With road space is meant the width and geometry of the road, and with its functions, for example, the roughness of the road surface, the road's friction and its load carrying capacity. In other words, the outputs of the road are to be specified in such a way that over its life cycle total economic benefits should be maximised, subject to assumptions about future traffic and its composition[9].

[8] See e.g. Vägverket [1995].
[9] This is the philosophy underlying some road planning models, including HDM developed by the World Bank.

How?

A contract in terms of output specifications is thus a necessary condition to allow for innovation in the road contracting industry. The next question to be posed is if DBO is sufficient or whether the F should be added to yield DBFO? And if so, in what way should the contractor mobilise the capital required?

Initially, it should be noted that DBO under any circumstances results in that the contractor must mobilise a larger working capital than required for an ordinary build contract, as the flow of payments is altered. In a build contract, the contractor is mainly paid during the construction phase. A DBO-contract entails as mentioned also a maintenance phase, and the need to verify outputs during this maintenance period. There will be a need for payments in respect of maintenance activities, as well as bonus or penalty payments on account of the road surpassing or not meeting the set performance requirements. In addition, additional payments may have to be made at the termination of the contract, say after 10 years, depending on the road condition at that time in relation with the performance requirements.

When bidding for a DBO-contract, the tenderer will thus not only carry the project specific risk associated with the project; he will also have to mobilise a substantial amount of working capital for a considerable amount of time, which may become expensive depending on what kind of guarantees he can offer. Different contractors are likely to differ in this regard, and their costs for borrowing money in the capital market will therefore also differ.

The implication is that an individual contractor when bidding for on a DBO-contract will have to take steps to spread the specific risk of the project. But also the road manager should be interested in promoting risk spreading, primarily to ensure effective competition in the tender process. If contractors have to borrow, their differing borrowing costs may well hamper competition

The solution to this problem is to use an intermediary as the contractor rather than the contractor *per se*, i.e. to e.g. enter into a contract with a separate project company, as now done in the UK when implementing DBFO-contracts. The official role of the project company is to both mobilise the contractor and the finance required, but the actual purpose of such a company is to provide for risk spreading so that the costs of the specific risk may be minimised. When a traditional contract based on input specifications is employed, and public monies finance the project, the tax paying public is used in order to eliminate the costs of the specific risks of a project. When an output specification approach is used, the special project company essentially fulfils the same purpose.

However, for the road manager there is an additional motive for the execution of the contract by way of a project company, viz. the need to assess the quality of the contractor. There is always the risk of default in contracting, but when output specifications are a feature of a contract, the risk of default becomes much larger. For the road manager, it is difficult to assess this risk. For the capital market, on the other hand, risk assessment is its trade, so by contracting by way of a special project vehicle, the road manager can assume that the proper due diligence of the ultimate construction company as well as the other financial arrangements to be put on place will be carried out.

In conclusion, if DBO should be introduced than it will normally be necessary to take a step further and introduce DBFO. Ultimately, the whole view of the road building process is to be changed. The road manager should not primarily procure roads; his task is to ensure that road services of acceptable quality

are delivered to his principals, the road users. And when he has been assured of that this is being done - and only then - should he pay for the services rendered.

Which Types of Risks?

The last question to be addressed is how the payments should be structured, and if it is possible to design them in such a way that the market risk may be transferred to the private sector. The purpose of the shadow tolls which have been used in DBFO-contracts in the UK is to transfer the market risk to the private sector. The answer to this question is important in order to be able to indicate what kind of risk that should be borne by the private sector in the road sector.

This paper will not contain an analysis of this aspect; the reader is referred to other literature which is summarised here[10]. It may be shown, however, that it is not possible for the capital market to reduce the cost of risk on account of that future traffic is uncertain, The reason is that the capital market can not compete concerning the market risk as different bidders will view this risk differently, ultimately on account of that the volume of future traffic is genuinely uncertain, i.e. the risks cannot be properly assessed by the market. The pricing mechanism does not function as the item subject to tender can not be specified in objective terms.

Are bidders not confronted with the same problem as concerns the risks associated with the investment proper? It is argued here that there are important differences, in particular that most of these risks may be managed. In addition, it is possible to obtain much more information about these risks by studying other similar projects which have already been implemented. Most project specific risks are therefore not genuinely uncertain as in the case of future traffic volumes. A third reason is that the total cost of a project is the sum of a large number of events, which means that individual events do not matter that much. A project has its own internal pooling capacity, so to say.

Whilst shadow tools are doubtful from an economic point of view, actual payments during different years should not necessarily be fixed. As indicated already, payments should vary by taking into account how well performance requirements are being met. A particularly important performance requirement is that the road lanes remain open to traffic as much as possible. Thus, if the contractor is forced to close road lanes in order to repair them there is scope for a penalty through reduced annual payments. And payments may also be reduced if the road has higher roughness than stipulated in the contract, etc.

The presentation above has focused on investment, including major reconstruction projects. However, the same reasoning applies equally to maintenance activities.

Concluding Words

The contracting formats typically used today do not promote technical development. To change that situation it will be necessary to allow for competition in the market for risk management, by replacing the present input oriented contracts with contracts based on outputs, or performance requirements. However, the advantage of DBFO-contracts is not only explained by their ability to promote innovations, but also by that they enable construction works to be undertaken much more quickly than is typically the case today; and that they allow for a proper consideration of the life-cycle costs of the roads.

[10] See Bruzelius [1998].

For the road manager, output specifications will give rise to new problems, viz. how to assess that the contractor is not only technically competent but also can execute the works without defaulting. In addition, there is a need to promote the reduction of the specific project risk costs to ensure strong competition when tendering. An effective way of dealing with these problems is to promote the creation of separate project companies to be the road manager's contracting party. The official role of the project company is to mobilise the resources, including the finance, but from an economic point of view its purpose is to reduce and equalise the bidders' project specific risk costs and to ensure a strong governance structure for risk management.

The conclusion is that contracting is not just about works but should normally also entail the mobilisation of the working capital for the performance of the works. Furthermore the road manager should only pay for services rendered, and according to set performance requirements. However, payments should not be based on shadow tolls; contractors have neither no real influence on traffic volumes, nor can they can they be expected to be able to predict the expected future volumes with a high degree of consistency.

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