



Framework for structuring public private partnerships in railways



Rachna Gangwar^{a,*}, G. Raghuram^b

^a TAPMI School of Business, Manipal University Jaipur, India

^b Indian Institute of Management Ahmedabad, India

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ABSTRACT

Structuring public private partnerships (PPP) in railways is a challenge, given its technology base, and obligation as a public and affordable mode of transportation. The sector provides strong incentives for vertical integration due to economies of scope. However, it is evident from the literature that large integrated PPPs in railway systems are not feasible due to higher commercial risks. They also suffer from implicit cross subsidization since the railway infrastructure is capital intensive, common to multiple revenue sources, and fare box revenues are generally not sufficient to recover investments. This is being addressed by various unbundling approaches in recent PPPs. The common unbundling is between infrastructure, operations, and services.

The objective of this research is to explore the potential of unbundling further and to come up with a framework that helps policy makers in taking macro level decisions on PPP structuring. The research disaggregates the railway system into over 40 'elements' wherein an element is the smallest unit that can be given to a party for execution. However this unbundling would result in significant horizontal and vertical interfaces between these elements.

A sustainable PPP would need to limit the extent of interfaces due to transaction costs and risks. This can be achieved by bundling the elements horizontally and/or vertically into 'entities' to extract the best value for a PPP. The governing principles would be scale economies (horizontal integration), scope economies (vertical integration), need for competition (horizontal disaggregation), level playing field, transactional transparency, and need for specialization (vertical disaggregation). Additional drivers would be appetite for investment, availability of competence and accountability for an entity. The findings of the research indicate that the entity formation is one of the most crucial aspects of a PPP in railways.

A consequential critical area is managing the interfaces between entities, which are subject to transaction costs and risks. These should be carefully identified and addressed by well-designed contractual agreements and independent regulation.

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1. Introduction

Development of railways only with public resources is a challenge for many governments across the world. Public private partnerships (PPPs) have emerged as a way forward for additional resources and increased market orientation. However, these are complex arrangements and can create potential problems if not properly structured and administered (TERA, 2006).

PPPs in railways are more challenging to structure than other modes due to railway's specific technology base, obligation as a

public and affordable mode of transportation, and strong incentives for vertical integration due to economies of scope. However, several studies have indicated that integrated PPPs in railways have not yielded good results financially. Examples are Channel Tunnel UK, London Underground and Taiwan High Speed Railways (Geest and Nunez-Ferrer, 2011; Williams, 2010; Kien-hong and Johannesson, 2012; Chou et al., 2012). These projects had to be restructured or taken over by the government after a few years of operations by the private party. This has justified the need for approaches based on unbundling.

This paper evolves a framework for PPP structuring based on an exhaustive unbundling of railway system into over 40 elements. It establishes the functional and economic linkages between elements, evolves principles for appropriate bundling of elements

* Corresponding author. Tel.: +91 9602644118.

E-mail address: rachna015@gmail.com (R. Gangwar).

into 'entities'¹, and brings out the implications of entity formation on interfaces.

2. Background of PPPs in railways

2.1. What is a PPP?

The term 'public-private partnership' (PPP or P3) has been in general use since 1990s, yet there is no widely agreed single definition or model of a PPP (Bernardino et al., 2010; OECD, 2010; The World Bank, 2006). Broadly it is a long term partnership between public and private sector for provisioning of public assets/services with substantial risk shared by the private party. Variations exist in different countries according to their earlier practices in the split of responsibilities between the State and private companies regarding provision of services of public interest (Viegas, 2010).

For the purpose of this research, we adopt the umbrella definition suggested by the Department of Economics Affairs (DEA) India which states that "PPP is an arrangement between a government or statutory entity or government owned entity on one side and a private sector entity on the other, for the provision of public assets and/or related services for public benefit, through investments being made by and/or management undertaken by the private sector entity for a specified time period, where there is a substantial risk sharing with the private sector and the private sector receives performance linked payments that conform (or are benchmarked) to specified, pre-determined and measurable performance standards (DEA, 2010)."

2.2. PPP structuring

'Structuring' in the context of PPP refers to the process of arriving at a partnership model for a project. The Handbook of PPP by ADB lists a set of guidelines for 'structuring a PPP' which include sector diagnostic (identification of technical, legal and regulatory constraints, institutional issues, commercial, financial and financing requirements, etc.), diagnostic of available PPP options, and finally selecting an appropriate option based on the diagnostic, interest of the market and special requirements of the sector. Some other papers (Clifton and Duffield, 2006; Iyer and Sagheer, 2009; Gross and Michael, 2011) have discussed structuring in specific contexts such as financial structuring, structuring of PPP risks, and structuring of toll road contracts. In all these papers, the term structuring referred to the process to arrive at an arrangement, be it financial, risk allocation or setting of toll prices respectively.

In the context of this paper, the term 'structuring' refers to the process of selecting elements for forming an 'entity'.

2.3. Types of PPPs in railways

Private investment in railways is not a new phenomenon. In fact, railways were originally built and operated by private companies in most parts of the world. However, with time, it became clear that network economies and reduced scope for competition put railways in a situation where a pure market was not the most beneficial system, and States began to take over their construction and operation (Bernardino et al., 2010).

Since the late 90s, governments started increasingly relying on private sector for financing of railway infrastructure or providing various services. Regulatory frameworks were created to guarantee the performance of private sector and protect the interests of users. What distinguishes the current partnerships from the earlier

is the way they are perceived and managed, and the role of regulation.

The recent move to attract private sector participation was driven by railways losing competitiveness to road and air. These two sectors have witnessed huge investments in the past few decades. The reasons for railways' deteriorating market share were inadequate investment in infrastructure, poor services, lack of market orientation, and overstaffing in railway companies. To address these problems, some governments restructured their public railway organizations into private companies/corporations. Some others opted for organizational and/or regulatory reforms to create a better policy environment for private participation.

It can be seen from various reforms that private participation in railways can be of two types: infrastructure related or service related. Infrastructure related implies that the private party invests in creating and maintaining the infrastructure for the concession period. Service related implies that private party provides transport services with or without owning the rolling stock. Private participation in services yielded good results in the UK and many other countries but in infrastructure, it is still a challenge (Nash and Matthews, 2002).

Should the scope of PPPs in railways limit to only infrastructure or should it also include services is contestable. In the European Union where services were opened to competition after the 1991 EC Directive (EC, 1991), private participation in services is not viewed as PPPs. This is also true in India for other transport sectors where services are open to competition e.g., aviation and maritime. However, since railways in India and many other parts of the world are still integrated, we include services under the ambit of PPPs in our framework.

2.4. PPP models

There are different models of PPP contracts depending on the split of responsibilities between public and private parties (Hansen, 2011). These models comprise some combination of design, build, finance, maintain, operate and transfer components (Higton and Clark, 2010).

PPP models in railways are still emerging due to complexities involved. Road models cannot be directly applied for railways since rail sector differs significantly from road in terms of technical expertise and level of capital investment.

Hansen (2011) conducted a study of 15 PPP projects. As of 2011, eight of these have been awarded and seven are in the pipeline. These projects (listed in Table 1) vary significantly in terms of route length, contract type, concession period, project costs, and subsidies provided by the government.

It can be observed from this list that almost all projects required government subsidies, at times more than 50% of the project cost. This implies that fare box revenues are not always sufficient to recover investments in infrastructure. This has to be dealt appropriately in PPP structuring. Policy decisions could be to provide direct subsidy, award on annuity, or bundle the project with positive externalities such as land development. The risk of traffic overestimation is higher in railways than in other modes. This further increases the revenue risk for the bidder.

In terms of type of concession, most of these projects are awarded on design, build, finance and maintain (DBFM) basis. Operation of trains has not been bundled in most of the concessions. Private party is given the concession only to create infrastructure and maintain it through the concession period. The demand risk is borne by the government. Projects that include operations are integrated concessions and the concessionaire bears the demand risk. Hansen argues that unbundling of infrastructure and train services can reduce overall costs and risks by stimulating increased competition and higher contract flexibility. Dehornoy (2012) based on his

¹ An entity is a set of elements bundled together horizontally and/or vertically to extract the best value in a PPP.

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