

Understanding the hold-up problem in the management of megaprojects: The case of the Channel Tunnel Rail Link project

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Abstract

This research examines the outcome of renegotiations that happened between the UK government and private investors in the Channel Tunnel Rail Link project and develops a model to formalise the evolution of bargaining power of these two parties in the contracting period. This model makes two novel contributions in the development of theoretical understanding to hold-up problems for project management: (1) the effect of financial arrangement on bargaining power balance is quantitatively examined; and (2) the relationship between bargaining power and quasi-rent is established through the application of the Nash bargaining model.

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1. Introduction

In recent decades, the number and importance of megaprojects has been on the rise (Esty, 2004). Large project size often goes hand in hand with greater complexity and longer project duration, both of which make it even more important to put well-conceived governance in place to effectively manage the contractual relationships between contracting parties (Ive and Rintala, 2006; NAO, 2001a; Winch, 2001). This complexity is compounded by the extensive use of private finance in public projects. The original drive for introducing private finance to public investment was to circumvent government spending restrictions. Against the backdrop of fiscal constraints and chronic under-investment in the 1980s, the Private Finance Initiative (PFI) emerged in 1992 as an alternative means to provide public serviced infrastructure in the UK. At the early stage of the PFI history, critics often discredited it as “the only show in town” (e.g., Rutherford, 2003), implying it was more to serve political than economic purposes.

The Channel Tunnel Rail Link (CTRL) project is a case in point because it was pressed ahead regardless. Since engaging private capital was prioritised from the very beginning, the bidder asking for the smallest government grants was naturally favoured. However, as this project turned out, the generous promise made by the winning bidder proved unsustainable. This is because least recourse to public finance seemed to have translated into the incentive to make “hold-up” demands at post-contract stage. The additional costs involved in resolving disputes and the concessions made by the government considerably undermined the economic rationale for seeking private capital to finance public projects. Not only did the hold-up problem occur in this project, but also in other major projects, e.g., Channel Tunnel project (Chang and Ive, 2007a), National Physical Laboratory PFI project, London Underground PPP project (Metronet and Tube Line), and West Coast Major Line Upgrading project. The ex post appropriation of value in the contracting process is generally regarded as a fundamental issue in formulating business strategy (MacDonald and Ryall, 2004). A deeper understanding of the nature of hold-up problems in projects is an important step required to improve the design of project governance.

On the theoretical front, the hold-up problem is generally deemed as “a fundamental determinant of contractual and

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organisational structure” in the analysis of economic organisation (Rogerson, 1992). It underpins the core of two influential theories of economic organisation: transaction cost economics (TCE) and the property right theory of the firm. The origin of hold-up threats stems from the fact that one party sometimes has more to lose than the other, where the transaction stalls half-way. As the contract is more of a “rule-in” than a “rule-out” device (Hart and Moore, 2008), it cannot govern all the contingencies that may occur during the contracting period. The party with greater stake to cover will become vulnerable in the negotiation for the liability of unexpected loss. In the development of our understanding of this problem, Klein et al. (1978) is a milestone contribution. This paper introduced for the first time the economic concept of quasi-rent to explain the root cause why hold-up might occur. Opposed to economic rent, which is a return to lure traders into a transaction, quasi-rent is the minimum return required to keep traders in the transaction. When quasi-rent is positive, a trader may find it desirable to make concessions in renegotiations to secure the continuation of the transaction. It means the size of quasi-rent is a good indicator for one party’s vulnerability. TCE posits that the presence of vulnerability would ramp up the other party’s tendency to bargain for extra rent and increase the risk of plunging two parties into rough disputes, resulting in unnecessary transaction costs (Williamson, 1985). In response to this problem, traders will choose a governance structure that can resolve disputes more efficaciously. By way of appropriate allocation of decision rights and payoff rights between contracting parties, governance structures can engender differential competencies in resolving the division of gain/loss arising from condition changes (Baker et al., 2003). As a result, aligning governance structures with transaction attributes can better balance the relative bargaining position of traders and facilitate more equitable trading relationships (Ahmadjian and Oxley, 2005; Bensaou and Anderson, 1999; Koss, 1999). This is the reason why substantial research efforts have been devoted to improving our understanding of the “appropriability hazard” (Klein, 2005; Lafontaine and Slade, 2007) and crafting solutions for it (Fares, 2006; Schmitz, 2001). Theoretically, the focus was placed on the application of bargaining models of one form or another, in designing ingenious renegotiation mechanisms for mitigating hold-up threats. Empirically, the issue concerned was the extent to which the observed choices of governance modes can be explained by theory. Despite these efforts, we still have limited knowledge about what has actually happened in the wake of hold-up-induced renegotiations. Without looking into this opaque box, some essential aspects of the problem may be lost in the modelling. The lack of study of this issue is not without reason. The information needed for such research is typically hard to come by due to commercial confidentiality. Fortunately, the review report of the Channel Tunnel Rail Link (CTRL) project conducted by the UK government auditor, the National Audit Office, and the evidence presented in the hearing held by the UK House of Commons, provides a valuable opportunity for researchers to uncover the contracting issues. The complexity of these issues would have otherwise been neglected by the simplifications made in theoretical and econometric modelling. Through the examination of the renegotiation process between

the UK government and the private investor in this project, this research is able to identify the key factors that have affected their bargaining power from the quasi-rent perspective. This research finds that, whereas the sunk investment is still a major source of lock-in effect, both capital structure and governance structure of the project company prove pivotal. These factors, currently ignored in the literature, should be addressed in the analysis of bargaining power allocation between contracting parties. What is more, once we have a reliable description of the evolution path of quasi-rent over the contracting period, we can then take proactive actions *ex ante* to manage the hold-up threat other than just through governance choice. An example is shown in Chang (2011), where the author argued that we can influence the quasi-rent *ex-post* bargaining process. Quasi-rent can also be considered as the limit of cost shocks that a contracting party can withstand. If we have a method to examine if financial protection measures are aligned with the perceived level of risk exposure, efficiency savings would be created. It is an area of research worth exploring in the future.

2. Literature review

The core issue this research is concerned with is the hold-up problem in the implementation of PFI projects. There are three strands of literature directly relevant to this research.

First, in recent years, we have seen a growing research interest in PFI. As the issues explored and the perspectives employed were very diverse, the focus of review here is restricted to economic analysis of contracting problems in PFI projects. Drawing on the incomplete contracting models originally developed in Grossman and Hart (1986) and Hart and Moore (1990), and further expounded in Hart (1995), Hart et al. (1997) aimed to explore the role of private ownership in alleviating the underinvestment problem. It is claimed that a great benefit of private ownership is to enable private investors to fully reap the efficiency savings of their cost-cutting efforts, thereby giving them stronger incentives to undertake innovative activity to cut the whole life cost for the project. Bennett and Iossa (2006) followed a similar line to study the desirability of granting the right to build and operate a project to a single firm. The authors suggested that bundling should be a more efficient strategy for cases where the quality of design and construction work can have a significant impact on operating costs. In these models, the return of efficiency-enhancing investments is to be split 50:50 between parties (i.e., the Nash bargaining solution) because the contract cannot fully govern some contingencies, owing to either indescribability or unforeseeability. However, this position is countered by the second strand of literature that endeavoured to develop solutions for hold-up problems.

Maskin and Tirole (1999) led the charge, claiming that sophisticated mechanisms can resolve the *ex post* allocation of unexpected gain/loss. The reasoning runs as follows. In renegotiations, traders face two options: keep on trading with the current partner (inside option) or switch to the best alternative (outside option). The outside option will be favoured if it yields a higher return than the inside one (known as the Outside Option Principle (Muthoo, 1999)). Provided the contract can be devised

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