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Public funding, perverse incentives, and counterproductive outcomes

Public funding

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Abstract

Purpose – The purpose of this paper is to explore the adverse incentives at the front end of government-funded projects with concentrated benefits and no liabilities for the privileged groups. In particular, the author discusses the risk of perverse incentives of the types typically found in the development aid sector that results in counterproductive outcomes.

Design/methodology/approach – The paper uses a simple conceptual framework based on agency theory. A qualitative, case-based approach with purposive sampling was chosen for the empirical part of the study. Eight Norwegian projects were selected because incentive problems were to be expected, and one development aid project served as a reference case.

Findings – The paper finds that low strategic project success corresponded well with the terms of financing. There were clear indications of agency problems, in three cases to the extent that the incentives turned perverse. The paper concludes with a discussion of relevant measures to prevent the emergence of perverse incentives.

Originality/value – The paper contributes to an improved understanding of the incentives related to public project initiation and selection, which is an under-researched topic and generally not included in formal project governance schemes. The research should therefore be useful to scholars as well as practitioners within the field of project governance.

Keywords Project governance, Agency theory, Public projects, Front-end management, Government funding, Perverse incentives

Paper type Research paper

Introduction

Government-funded projects, such as transportation infrastructure, public buildings and major sporting events, are normally intended to serve some overall societal goal and ultimately to benefit the whole nation. However, in many cases, the benefits are relatively concentrated in specific groups or regions (e.g. local public goods). There may be good reasons why such projects are government funded, such as to promote redistribution or provide insurance or external benefits. Nevertheless, such projects will appear as “gifts” to a privileged group that is often heavily involved in preparing the project proposal. The starting point for this study was our general impression that such projects often score low on relevance and viability when seen in retrospect. They end up being oversized and expensive, and in some cases, it is not even clear whether they fulfill a genuine need.

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This paper is based on a research project funded by the Concept research program and retrieved from www.ntnu.no/concept. Preliminary results were presented in a Norwegian report, Samset *et al.* (2014) and later in a conference paper presented at IRNOP 2015 (Volden and Samset, 2015). The author would like to thank Professor Knut Samset for many interesting discussions and useful comments on an earlier draft.



Public projects have varying reputations. The problem of cost overrun is particularly well documented (Flyvbjerg *et al.*, 2003; Morris and Hough, 1991; van Wee, 2007). Equally serious, but less studied, is the problem that occurs when projects do not meet the expectations of users and society. In extreme cases, the investment is wasted. Flyvbjerg *et al.* (2003) discussed the consistent problem of benefit shortfalls in the transport sector. Moreover, they noted that environmental and other negative side effects are systematically downplayed, whereas regional economic benefits are overestimated. Solberg and Preuss (2007) described how major sporting events are often justified by tourism-related and other economic impacts but fail to realize such effects. Furthermore, some authors note that many ICT projects do not meet the expectations of users and end up being abandoned or reworked (Cicmil and Braddon, 2012; Pinto, 2006).

Cantarelli *et al.* (2010) offered four explanations for project failures, each of which may be relevant to varying degrees in specific projects, but they generally reinforce each other: technical, psychological, economic and political explanations. In this study, we focus on the latter type, which occurs when certain stakeholders deliberately present a biased business case in order to increase the chance that a specific project will be selected. We use agency theory to explain the relationship between the government as the principal and the privileged group as the agent and demonstrate that the terms of financing can create a serious conflict of interest at the front end and cause projects to fail strategically (including the wrong projects being selected).

Samset (2003) argued that to be truly successful, projects must perform well tactically and strategically, not just operationally. In recent years, several authors have highlighted the importance of taking a holistic and “big picture” perspective on projects (Morris, 2013; Shenhar, 2004; Williams and Samset, 2010; Zwikael and Smyrk, 2012). They have also highlighted the crucial role of the front-end phase of projects. This is the stage when the project is justified, and key assumptions are made. Poor project ideas can also be screened out at no cost at this stage. However, in practice, the acceptance of a project concept at this early stage may be almost impossible to reverse due to the expectations it generates. Cantarelli *et al.* (2012) used the term “lock-in” to describe the situation in which decision makers are *de facto* committed before the formal decision to build. van Wee and Rietveld (2013) found it very likely that the extent of cost overruns reported in the international literature is greatly underestimated because most studies compare the final cost with the formal budget. Instead, they should have compared the final cost with the estimate at the time of *de facto* approval. Andersen *et al.* (2016) explored 12 Norwegian projects through their earliest phases and showed that the increase from the initial estimate to the formally approved budget was significant (on average 350 percent) and many times higher than the increase from the approved budget to the final cost. These results have been confirmed by a more recent study from Norway that includes a larger sample but is limited to road projects (Welde and Odeck, 2017). However, none of the authors of the abovementioned studies asked explicitly who proposed the project or how it was financed (e.g. whether it was 100 percent government funded or had some level of co-financing).

As noted by Samset and Volden (2016), addressing the front-end phase and securing the strategic performance of public projects often proves to be a highly complex matter. In this paper, we only explore one specific factor that may explain why public projects fail strategically, namely, the terms of financing. When a group views a project as free of charge, the group’s perspective will be positive as long as the benefits that accrue to them do not become negative. Even in cases when the target group is largely indifferent, there may be an intermediary party that has much to gain. The experiences gained from development aid projects are particularly useful for exploring this problem, which is also where we find the most extreme cases of perverse incentives.

The paper is organized as follows. In the next section, we review the literature relevant to incentives at the front end of public projects. Thereafter, we present the framework for analysis before describing the data that relate to our nine case projects. The main findings are presented and then further discussed in the final sections of the paper.

Extant literature

Agency theory

Agency theory originated in economics; it pertains to a situation in which a principal depends on an agent to achieve his or her goals, but the agent may pursue a different objective and thus act in his or her self-interest (Eisenhardt, 1989; Laffont and Martimort, 2002; Tirole, 1994). Due to external uncertainty, it is impossible to know for certain whether the agent is acting in the best interests of the principal. Thus, a problem is generated by the combination of conflicting goals and asymmetric information.

In general, there are two types of agency problems. One type is moral hazard problems, which typically occur when an agent is guaranteed a benefit regardless of whether he or she exerts the proper level of effort. This approach makes contractors inefficient, insured people more careless, and, we expect, a group that can freely acquire a new piece of infrastructure cares less about its value for money. The typical remedy is to ensure that the agent bears some of the costs of his or her actions (i.e. by introducing an incentives-based scheme). Alternatively, monitoring and control systems can be established to overcome the asymmetry of information. The second type of agency problem relates to adverse selection, which can occur in a situation in which a choice between alternatives must be made by the principal under uncertainty, and the agent, who knows the quality of each choice, may be motivated to offer the principal the poorer alternative. Again, the solution is to design proper incentive schemes and/or to invest in information. If the parties meet regularly, learning and reputation can also work as a disciplining factor. The optimal solution in each case depends on, *inter alia*, the seriousness of the goal conflict, the risk level, the agent's risk attitude and ability to control risk, and the cost of obtaining information.

The term perverse incentives refers to agency problems so severe that they yield outcomes in the opposite direction of the intention – that is, more negative than positive. A prominent example is described by Vann (2003) as “the great Hanoi rat massacre.” In 1902, Hanoi was facing the bubonic plague from rats that had spread throughout the city. To address the problem, the government decided to pay a bounty for each rat killed. The rat's tail had to be provided as evidence. At first, the scheme was successful, but the rat hunters soon realized that they would be better off keeping the tailless rats alive to breed more rats for their tails. Rat farming became popular, and the problem went from better to worse. The authorities' use of a bounty thus had the opposite effect of what was intended.

Agency theory was originally used to describe the relationship between the owner and managers of firms, but it can be applied to a variety of situations within and between organizations. Tirole (1994) discussed how the theory of incentives can be helpful to understand the public sector. In this sector, the incentive problem is partly related to the risk of “capture,” which stems from officials' discretionary power. Therefore, monitoring and control is crucial to ensure accountability.

Agency and the project governance literature

Agency theory is a logical starting point for studies of modern corporate governance, of which project governance is often seen as a subset (Müller, 2009; Müller and Turner, 2005). A key issue is to ensure that the implementing agent will act in conformity with the interests of the owner. However, the literature on project governance is still fragmented, and different perspectives have been used in different studies (Ahola *et al.*, 2014). Williams *et al.* (2010) distinguished between governance of projects, which aims for efficient delivery, and governance through projects, which aims to choose the right concepts and ensure that the intended effects are realized. In practice, the focus in the literature as well as in practice has been more on the former than the latter (Volden and Andersen, 2018), and to date, this is where agency theory has had an influence. An exception is Zwikael and Smyrk (2015), who showed that there are principal-agent relationships at multiple levels, with the “funder” on

top, who hires a project owner to be accountable for benefits realization, and the project owner, in turn, hires a project manager to be accountable for efficient output.

Opportunistic behavior has been particularly studied in relation to the choice of contract strategy and the relationship between commissioner and contractor. For example, a number of authors have discussed the optimal design of public–private partnership contracts from a principal–agent perspective (Boardman and Vining, 2012; Ho *et al.*, 2015; Iossa and Martimort, 2015; Liu *et al.*, 2016). The key is to make the contractor accountable, both to ensure efficient implementation and for the operational and maintenance phase.

Biesenthal and Wilden (2014) found that principal–agent theory has been somewhat less influential in relation to the organizational level (corporate governance). Although agency theory can also be useful to understand organizations (Eisenhardt, 1989), it can be argued that it provides a somewhat narrow perspective, with its often strong focus on “hard incentives” (Joslin and Müller, 2016). In the study of organizations, the theory should therefore not be used alone but rather in combination with other theories, such as stakeholder and stewardship theory, transaction cost economics and resource dependence theory (Biesenthal and Wilden, 2014).

Our focus is not on the project-based organization but rather on the whole nation and the government as principal, who receives project proposals from various agents. To date, the project governance literature has largely disregarded this perspective. Admittedly, there is a wide body of literature on stakeholder involvement in which it is noted that stakeholder inclusiveness involves the risk of expectation escalation (Eskerod *et al.*, 2015). Further, Morris and Hough’s (1991) study is pivotal because the authors examine factors “beyond project management,” such as political and organizational aspects and community involvement. However, there have not been any follow-up studies.

A few more recent studies have analyzed project governance frameworks for major public projects (Volden and Andersen, 2018; Volden and Samset, 2017a; Williams *et al.*, 2010). They all document an increasing focus on the front end, including quality assurance of the business case. However, Volden and Andersen (2018) noted that the earliest idea phase is generally not included in the governance schemes, with the argument being that this phase addresses “strategic and political issues beyond the project.” Project ideas are often initiated or “picked up” from below, but procedures and roles in this phase are nonexistent.

Studies on over-optimism and deception

Another relevant group of studies is those that address deception and similar phenomena in public projects. Bent Flyvbjerg and his colleagues stand out, with their many publications on cost overruns and benefit shortfalls, especially in transport projects, which they explain as largely due to deliberate miscalculations on the part of key stakeholders and project promoters (Flyvbjerg, 2009; Flyvbjerg *et al.*, 2002, 2003, 2009; Cantarelli *et al.*, 2010). The issue has also been raised by, among others, Wachs (1987, 1989) and Mackie and Preston (1998). Solberg and Preuss (2007, 2015) discussed how major sporting events are often funded by the national government based on the argument that they are public goods, but this approach often leads groups of “free riders” (at the host destination) to exaggerate the economic value of the event and downplay the cost.

However, as noted by Siemiatycki (2016), these studies have not been very influential in the engineering/project management field, in which cost overruns are still largely explained by “honest errors.” Deliberate manipulation is difficult to prove and especially to distinguish from over-optimism stemming from cognitive biases (Lovallo and Kahneman, 2003; Meyer, 2014).

Lefley (2006) discussed the role of the project champion, and how this person may bias project selection. Through a single case, Lefley demonstrated that the project champion, who was also a member of the appraisal team, clearly gave more optimistic scores than the others on the team. Pinto and Patanakul (2015) examined the situation in which project champions turn into narcissists; the authors argued that champions tend to select riskier,

more high-profile projects and are more likely to escalate commitment in the face of clear evidence of poor performance.

Other publications have addressed related topics. Kvalnes (2014) explored the concept of dishonesty and used it to explain misreporting issues in projects. He argued that truth telling is not necessarily an inherent characteristic of a person but may depend on the situation. Locatelli *et al.* (2017) introduced the term corrupt project context and highlighted it as a factor that can undermine the performance of projects. They also argued that public megaprojects hold a special risk of corruption due to high economic rents, public officials' discretionary power and often weak institutions.

Experiences from development aid projects

A branch of the literature that is particularly relevant is studies of the effects of development aid. There has been a growing awareness of the adverse incentives created by access to "free funding" and how it can affect outcomes negatively. For a literature review, see Newby (2010) or Wiig and Holm-Hansen (2014). It is also useful to visit Merton's (1936) classic text on unanticipated effects on purposive social action and Boulding's (1981) textbook on grants as an economic phenomenon. An important message is that it is naïve to believe that a scheme or project meant for the common good will be perceived that way by everyone involved. There will always be some who win and some who lose, and all those involved will adapt in a way that is best for themselves. This must be well understood in order to design an effective scheme.

A pivotal study was conducted by Ostrom *et al.* (2001), who used agency theory to explain what happens. Moral hazard problems imply, for example, that recipient countries take less responsibility for investing in infrastructure. They exchange their own funding for aid, implying that in effect, the money does not finance new projects, but rather something else that was not intended by the donors. Adverse selection problems are very common and can be observed in the form of unviable projects being approved by the donor country. Generally, information asymmetry makes these problems occur. Furthermore, the problems increase with the number of layers in the hierarchy. Contractors are crucial because they may have an interest in particular projects being selected and prolonged. The contractor is often the initiator and serves as the link between the recipient group and the funder; thus, he controls the flow of information in both directions.

The phenomenon perverse incentives is frequently observed in this sector. A typical example is when aid intended to make the recipient community more robust actually makes it more dependent on long-term foreign aid. Ostrom *et al.* (2001) indicated serious problems with perverse incentives at many levels that result in unsuccessful projects, waste of public funds and corruption.

The key message is that donors must be aware of the incentives that they create with their aid. The multifaceted set of relationships should be properly analyzed to see how they will be affected by new projects. Local beneficiaries' ownership should be strengthened by making them enunciate a demand for aid, allocate at least some of their own assets to the project, obtain benefits and have clear-cut responsibilities. The prospects for solving the agency problem are, however, not very encouraging due to the weak institutions found in many of these countries.

Fiscal federalism

Incentive problems related to funding between the central and local level have also been studied in developed countries. Fiscal federalism is a field in public economics that discusses how revenues and costs should be allocated across the vertical layers of administration (e.g. Oates, 1999). According to welfare economic principles, local public goods, such as local transportation infrastructure, should be provided and funded at the local level which knows the local preferences best. When local taxes reflect the benefits of local services, anyone can move to the municipality of their choice (Tiebout, 1956).

There may be good reasons for the national government to transfer money to the local level. One is local risk aversion and the need for the government to act as an insurance company. Another is the positive external effects of investment in one region on neighboring regions and even for the nation as a whole. A third argument concerns, in the same way as in development aid, preferences for redistribution from rich to poor regions. However, regardless of which argument is used, federal grants on a large scale create an imbalance between geographically concentrated benefits and dispersed costs and give rise to incentive problems, such as a lack of economic discipline and recurrent problems with bailouts. Game theory has been used to show that the national government lacks credibility when announcing “hard budget constraints” because it will be better off saving an irresponsible municipality than allowing it go bankrupt (Goodspeed, 2002; Rodden *et al.*, 2003; Wildasin, 2004). de Rus and Socorro (2010) discussed a similar problem in relation to infrastructure with supranational (EU) funding and the incentives that occur in national governments.

How we intend to fill the gap

We have searched rather broadly for relevant studies that use theory of incentives to explain what occurs at the front end of public projects, such as over-optimistic appraisals and their effects on project selection and strategic success. Agency theory has definitely inspired the project management and project governance literature. However, it has primarily been used in discussions of how to motivate project managers and contractors and less so in relation to the front-end phase, in which the project promoters are typically external parties. Flyvbjerg is one of a few researchers who have discussed miscalculations and deception on the part of local communities and others in the front-end phase.

However, in the development aid sector we find a long tradition of studying adverse and even perverse incentives in relation to project selection, which may be explained by “free funding.” There are some important distinctions between infrastructure projects in a developed country such as Norway and projects funded by an external donor in a developing country. After all, the allocation of a common tax pool is a democratic issue that concerns all groups in society, not a gift from one party to another. However, there are clear similarities: in a developed country, just as in a developing country, the group that gains from the project will (if small enough) consider the project to be practically free-of-charge. Moreover, in both cases, there may be several layers of principal-agent relationships from the funder to the privileged group, where only the top level (at best) is concerned about the common good for the larger society. As part of our study, we explore how far this comparison with aid projects can be taken. We also find some inspiration from the literature on fiscal federalism, although it takes more of a macroeconomic perspective than a project perspective.

In this study, we explore the financial incentives and principal-agent relations at the front end of a sample of Norwegian Government-funded projects. In particular, we look for cases of perverse incentives of the types found in the development aid sector. We also discuss what can be done to avoid the problem and whether any measures taken in the studied projects either mitigated or avoided the most perverse outcome.

We hope that our contribution will provide an improved understanding of the incentives related to public project initiation. We currently know little about the earliest idea phase of public projects, which is often not included in governance schemes. Our research should therefore be useful to scholars as well as practitioners within the field of project governance.

Our framework of analysis

In this section, we present our framework of analysis, which is based on agency theory.

Simple model

In its simplest form, the model includes two parties: the national government as the funding party and the group or community that receives the major portion of the benefits. This concentration of benefits implies that we focus on local public goods (or even private goods) as opposed to national public goods such as defense acquisitions and national highways, for which the benefits would be almost uniformly distributed across the population.

Project approval and funding is discretionary; hence, the alternative for the privileged group is to receive nothing. The privileged group is more or less well organized. Its role is to provide the government with information about local conditions and to propose new projects when needed. Project implementation, which is not the issue here, occurs under the auspices of the government or of an agency whose perception on project selection does not differ from the government's perception.

Agency problems arise when two preconditions are present: an underlying conflict of interest and information asymmetry. This is illustrated in Figure 1 in terms of a flow of unconditional funding on the right-hand side and a restricted information flow in the opposite direction (hence the dotted line) on the left-hand side.

The conflict of interest is introduced by the combination of distributed costs and concentrated benefits. If we assume that costs and benefits can be measured in monetary terms and that the government's decision criterion is the benefit–cost ratio, abbreviated as BC ratio = B/C , it can easily be shown that the privileged group's BC ratio always exceeds the government's BC ratio as long as the privileged group's share of the benefits exceeds its share of the costs. The other precondition for agency problems is that the government cannot verify the information coming from below.

Agency problems at the front end can be expected to materialize in three main ways:

- (1) Positively skewed appraisal: the privileged group presents a biased appraisal in order to pass the point of *de facto* approval. A variant is strategic split-up (i.e. only presenting the main project component at first and then later disclosing the remaining components and adjoining projects). Lobbying activities to affect the government's "demand" for the project are also included in this category.
- (2) Expansion after *de facto* approval: a related group of problems occurs when the level of ambition is kept low until the decision makers are *de facto* committed. Then, a restricted scope is turned into an oversized project.
- (3) Moral hazard: whereas the first two are adverse selection problems, cases with moral hazard problems can also occur. This is when the privileged group's promises to contribute for complementary local projects or to sufficient maintenance, and to take responsibility for benefits realization and sustainability in the long run, is not followed up.

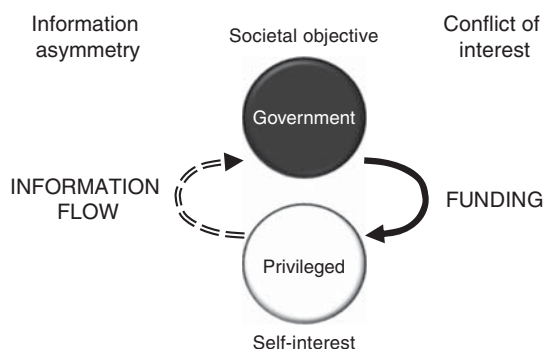


Figure 1.
Incentive problems in
public investment
projects – simple
presentation

In extreme cases, incentives may turn perverse, resulting in counterproductive outcome. It is not easy to provide a precise definition of perverse incentives, for example, in terms of a threshold level for the national BC ratio, but here we define perverse incentives as “agency problems that are so severe that they lead to the selection of projects that are highly unsuccessful in strategic terms and a waste of public funds.”

Extended model

A more realistic model should take into account that a whole chain of principal-agent relationships may be involved. Between the government and the ultimate beneficiaries, there may be one or more intermediaries such as a local government, or a self-interested public agency or consultancy firm. The intermediary will typically receive funding on behalf of the privileged group, which adds to the information asymmetry. Intermediaries have their own objectives, such as to maximize their budget. In development assistance, consultancy firms are often major contributors to agency problems because they convince donor governments to choose particular projects that benefit themselves (Ostrom *et al.*, 2001). However, an intermediary’s private objectives may not be visible in the project appraisal, where this actor pretends to be concerned about the societal impact.

We could extend this model further by, for example, including additional layers in the upper part to take into account the fact that bureaucrats are agents for politicians, and politicians are, in turn, agents for the people. However, such relationships are less formalized; thus, adverse incentives would be difficult to document empirically. Another extension would be to include stakeholders who are not officially involved in the transaction but enter the process as “freeloaders” and try to influence the selection process, such as neighboring landowners or possible suppliers for a future project.

We present a simplified illustration of our model with only one intermediary in Figure 2.

Methodology and data

This study is only meant to be an initial probe into the phenomenon of perverse incentives at the front end of public projects. We have therefore chosen a qualitative, case-based approach with purposive sampling, where the aim is not to draw conclusions about scope and frequencies but rather to identify and understand the mechanisms and provide some

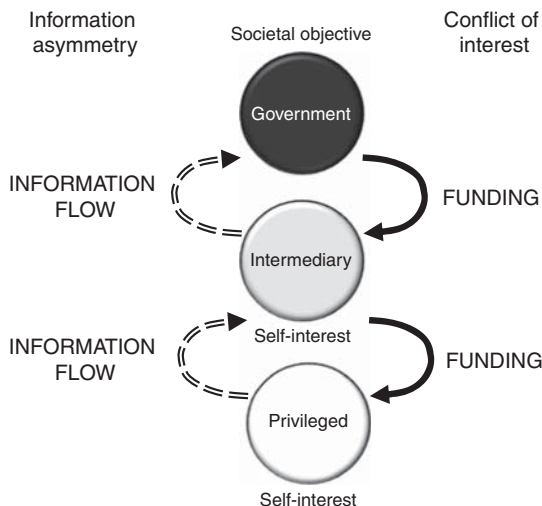


Figure 2.
Perverse incentives in public investment projects – extended model

insights into the subject matter. In line with Yin (2014), we find that the concrete, context-dependent knowledge that can be obtained from case studies is highly valuable and that precisely because of the detailed understanding of the causal relationships that are obtained, the results can be applied to other contexts. Furthermore, as noted by Flyvbjerg (2006), extreme cases can often reveal more information and clarify deeper causes better than average cases.

We address the following research questions:

- RQ1.* Describe the principal–agent relationships at the front end of the case projects, in terms of degree of conflict of interest and information asymmetry.
- RQ2.* What types of agency problems, if any, materialize in the case projects? (cf. the three types listed above).
- RQ3.* How do these problems seem to affect the projects' strategic success?
- RQ4.* What occurs in the extreme cases when agency problems turn perverse?
- RQ5.* Describe any steps taken to try to avoid or mitigate the problems.

Our sample consists of one aid project, which serves as a reference case, and eight government-funded investment projects from different sectors in Norway. The nine case projects were not selected randomly but rather because they were assumed to represent cases of perverse incentives. Our selection criteria were that each project was large in terms of investment cost; benefitted a limited group or community; was funded by the state, with few or no obligations for the privileged group; used discretionary funding; and had data available on the actors, costs and benefit estimates from the project's front-end history. Details of the selected projects are provided in Table I.

We mostly used secondary sources, namely, document studies from the projects' front-end phases, such as needs analyses, business cases, risk assessments and cost estimates, and we supplemented these data with interview data (two to three semi-structured interviews per case) and information from the public debate retrieved from the Norwegian digital media archive Retriever. All the case projects were large, and most of them were widely debated, both before and after they were implemented. Therefore, there are large amounts of publicly available information.

For each project, we identified the parties involved, their preferences and their roles in the front-end phase (privileged group, intermediary or others). In addition, we described the flows of funding and information in order to identify indications of agency problems and, in extreme cases, perverse incentives. We also assessed the projects' strategic success, defined as the extent to which they appeared relevant and feasible even in the long term, and whether the total benefits were worth the cost. Any statements from the government or by independent analysts concerning this issue were registered retrospectively and supplemented by our own analyses. Finally, we registered any attempts to avoid or mitigate emerging problems or discussions about such measures.

Findings and analysis

The main findings from our analysis are summarized in Table II and explained further below.

Principal–agent relationships

All nine case projects had in common that they were largely funded by the Norwegian Government while they benefitted specific groups. The thickness of the right arrow in each figure in Table II indicates the seriousness of the conflict of interest, which depends on the combination of the privileged group's share of benefits and costs. Any imbalance was normally in line with the intention, but in some cases, the original objective as defined by the

Table I.
The projects studied
($n = 9$), sorted by
co-financing

Name of project	Description	Status as of 2017	Target group/privileged	Co-financing	Total cost (NOK million)	Year completed
Turkana Fisheries	Aid project in Kenya, including a refrigeration plant, fishing boats, trucks and roads, to generate employment and improve living conditions for nomads	Many unforeseen problems occurred. The fish resources were limited, and the plant's operational costs were unacceptable. The nomads' situation worsened, and the project was terminated many years later	Nomads in Kenya	None	1,500	1990
Linesøya Bridge	Bridge to a remote island in central Norway. The goal was to stop depopulation and boost the local economy	Investment cost was twice as high as budgeted. Depopulation continued, and the level of traffic is very low today	Islanders from Linesøya	None	250	2011
Stad Shipping Tunnel	1.7 km tunnel for boats on the west coast of Norway to avoid the coast in dangerous seas	After decades of planning, the local expectations are high, but the cost estimate has increased rapidly. The government has signaled that funding will be provided	Local fishermen and other inhabitants in the Stad area	None	2,500 ^a	n/a
E16 Laerdal Road Tunnel	Road tunnel along one of the five roads (not the shortest) between the cities of Oslo and Bergen through the small town of Laerdal	It was the world's longest road tunnel when it was built (24.5 km). The tunnel is still in daily use, though with little traffic, primarily local	Inhabitants of the Laerdal region	None	1,050	2000
Winter Olympics in Lillehammer	Venue and organization of the 1994 Winter Olympics, with the intention to "sell" Norway as a tourist destination and stimulate growth in the eastern part of the country	The event was highly successful as a sporting event, but the project became very expensive, and the long-term economic impacts were limited	Inhabitants of the Lillehammer area/sports enthusiasts in the nation	None	7,500	1994
Loføst Link Road	Roads and tunnels connecting the Lofoten region to the mainland	There was considerable disagreement about the choice of route. The chosen route contributed to the isolation of the neighboring Vesterålen region	Inhabitants of the Lofoten region	None	1,367	2007
Rock City	Museum in the town of Namsos in central Norway. Was partly funded by the government to be a national center for pop and rock music	The music industry found the location remote. In practice, it was run as a center for local music. Was eventually taken over by Namsos municipality but is currently being closed down	Inhabitants of the town of Namsos	Some	50	2013
St Olavs Hospital	Renewal and expansion of the main hospital in central Norway	The hospital has received prizes for its architecture, but the investment cost was high, and it is considered an expensive way to operate a hospital	Sick people/inhabitants of the Trondheim region	Some	13,000	2014
Hvaler Road tunnel	Subsea road tunnel to a small island in south-east Norway. Partly initiated to reduce depopulation	Was partly funded by motorists in the larger region through toll roads, which led to conflicts for some time. Depopulation seems to have been avoided	Inhabitants of the Hvaler area	Some	200	1989

Note: ^aEstimate, since the project has not yet been implemented

Name of project	Turkana Fisheries	Linesaya Bridge	Stad shipping tunnel	E16 Laerdal tunnel	Winter Olympics	Lofast Link Road	Rock City	St Olavs Hospital	Hvaler Road tunnel	
Principal-agent relationships										
Who initiated the project	Intermediary	Privileged	Privileged	Parliamentarians	Privileged	Privileged	Privileged	Intermediary	Funding party	
Risk of agency problems	Conflict of interest ^a	Yes	Yes	Yes	Yes (different groups)	Yes (different groups)	Partly	Partly	Partly (different groups)	
	Info asymmetry	Yes	Yes	Some	Some	Yes	Some	Yes	Some	
Agency problems materialized	Positively skewed appraisal	Yes	Yes, probably deliberate	Yes, probably deliberate	n/a, widespread lobbying	Yes, and widespread lobbying	No	Yes, and widespread lobbying	Partly	
	Expansion after de facto approval	Yes, took 20 years to terminate	Partly	Yes, the scope increased over time	Uncertain	Yes, until reorganization was required	Uncertain	Uncertain	Yes, to a very large extent	No
	Moral hazard	Yes, infrastructure not maintained	Partly	Uncertain	Uncertain	Partly	Uncertain	Partly, until more local funding required	Yes	Uncertain
Strategic success	Value to privileged group	No	Yes, useful to locals, but they are few	No	Yes, useful to locals, but they are few	Yes	Yes, high for one group, but low for another	Yes, until more local funding required	Yes, until more local funding required	Yes, high for one group, but low for another
	Value to society	No	No, other projects displaced	No, low value for money	Partly	Partly	No, low for the region as a whole	No	Partly, low to medium value for money	Yes, relevant for the region as a whole
Perverse incentives?	Yes	Yes	Yes	Partly	Partly	No	No	Partly	No	

Table II.
Main findings summarized

Notes: $n=9$. ^aAgent with a combination of high share of benefits and low share of costs

government was broader and related to national goals. For example, the E16 Laerdal Road Tunnel was intended to improve the main road between two major cities in Norway, and Rock City was established as a national center for pop and rock music, but in both cases, the local perspective became dominant. Together with the information asymmetry, which was present to a greater or lesser extent in all projects, this indicated an inherent risk of agency problems in all the projects.

A state agency was normally involved, but in most cases was not considered self-interested; therefore, such agencies are considered part of the “government” in the figures. On the other hand, all the projects also had intermediaries that represented an additional layer of agency problems, such as the county and/or the affected municipality, and in some cases, specific organizations were established to represent the privileged groups.

In contrast to the aid project, the intermediaries in the Norwegian projects did not dominate the privileged groups, which were profoundly involved in project initiation, design and planning (but not implementation). Notably, there was not always a single privileged group, but we found examples of conflicts of interest between groups at the local level.

Agency problems materialized

Clear signs of agency problems materialized in several projects. Generally, adverse selection problems were the easiest to identify, whereas moral hazard problems, such as those seen in the aid project, were less prominent in the Norwegian cases.

In particular, the initial cost estimate presented by the privileged groups was underestimated in most cases. We observed indications that this was done deliberately, but it was difficult to obtain confirmation from the interviewees. For example, the initial cost estimate for the venue and organization of the Winter Olympics Project was clearly unrealistic at less than 25 percent of the final cost. Similarly, the benefits for users and society were overestimated. In the Linesøya Bridge case, the first cost–benefit analysis indicated that the project was marginally profitable, while the final result showed a cost 200 percent higher than the estimate and benefits at only 25 percent of the estimate, resulting in extremely low value for money. There was also a clear tendency for some of the case projects to be supersized, and the cost-driving requirements were strategically presented after passing the stage of *de facto* approval. The Stad Shipping Tunnel, the Winter Olympics and St Olavs Hospital were the three worst cases in this regard.

The government seems to have had surprisingly high confidence in the information provided by the initiating party in each case. Appraisals were either provided by the agents themselves or by the state agency based on input from the agents. Only in one project (the Stad Shipping Tunnel) did the government, admittedly very late in the process, demand an external review of the business case. In two of the projects, the incentive problems were clearly amplified when key politicians and other stakeholders on the funding party's side either had their own agenda (campaigning) or their loyalty was with the privileged group rather than with society at large.

Strategic project success

We conducted a rough assessment of the projects' value to the privileged group, as measured by user benefits, and to society as a whole, as measured by alignment with national policy and value for money. It is clear that the user benefits were often not at the anticipated level. However, in most of the projects the privileged group was either indifferent or satisfied with the situation. Only the aid project generated impacts on the target group that were clearly negative. In the case of the Shipping Tunnel, it is unlikely that the project will improve the lives of the target group at all, whereas the other seven projects did bring some (often limited) user benefits. As will be discussed further below, in three cases, the terms for funding changed during the process, and the privileged group eventually had to take responsibility for a considerable share of the cost as well. In one of these projects, this led to bankruptcy.

The value to the broader society was considered meager in all projects but one. Our analysis and assessments show that at least four of the projects (Turkana Fisheries, Linesøya Bridge, Stad Shipping Tunnel and Rock City) brought so little value and their relevance to society was so low that they should never have been approved, from a rational, economic perspective. In these cases, a different project would have resulted in more efficient and effective solutions to the problems at hand, or there was no need for an investment at all.

Perverse incentives?

We also looked for perverse incentives, leading to counterproductive outcome. We have already argued that four of the projects were outright failures in strategic terms. But were they selected because the government was misled by self-interested agents? In the following, we argue that the answer is yes in three out of the four cases, with the exception of Rock City.

Admittedly, the project appraisal for the Rock City project was also biased, and the government was misled to believe that the museum would be operated as a national center for pop and rock music, not just as a local center. However, the seriousness of the agency problem was more limited in this case. The government's share of the funding was only approximately one-third, and the initiators must have known that in the longer run, the museum would have to be self-sustaining. Therefore, we conclude that the initiators mainly misled themselves into believing that the museum would be financially viable and would boost the local economy. The case is an example of over-optimism more than perverse incentives.

The first project with perverse incentives was the reference project from development aid aimed to generate employment for nomads in a remote area of Kenya. It was originally initiated to mitigate a short-term crisis, but became a permanent and extremely costly commitment encouraged by the Norwegian entrepreneurs. The result was a complete failure from all perspectives except that of the entrepreneurs'. The implicit assumption that the nomads supported the development was not verified, and there were large unintended effects on the environment.

Two of the Norwegian projects were on par with the aid project: Linesøya Bridge and the Shipping Tunnel. The former was a fully government-funded project to build a bridge connecting a small population on an island to the mainland. The privileged group, as represented by local politicians and landowners, was heavily involved in lobbying upfront and presenting visions of economic growth and wider benefits. This lobbying was supported by a cost-benefit analysis that later turned out to be flawed. The decrease in population continued, and there has hardly been any commercial activity on the island. Only some local landowners have benefitted from selling plots of land to tourists. There were also indications that the municipality never followed up and expended the effort that it should have to stop the depopulation (i.e. a moral hazard).

In the case of the Shipping Tunnel, local authorities promoted the project for decades, and a lobbying organization was established with the sole purpose of ensuring that the project would be realized. At first, the main argument was that ships in the area faced high risks from dangerous seas. Some national politicians signaled a positive attitude toward the project, which encouraged the lobbying group. However, over the years, vessels became larger and safer, and wave detection technology was implemented, such that eventually there was no longer any need for the project. Still, the proponents did not want to let go of the idea. They brought new arguments to the table, including that the project would provide local employment opportunities and that the tunnel would be a tourist attraction, or simply "it has already been promised to us."

The project has still not been implemented, and over time the government has turned suspicious about the project. The government has commissioned several independent analyses that demonstrate its low value for money. But surprisingly, it might be too late to stop it now due to the effects of perverse incentives over more than 20 years. The fundamental problem seems to be that the government never refuted the premise that the funding should come entirely from the state. Therefore, the trend has been for local proponents to come forward with new proposals that steadily increase in the scale, scope and ultimately the cost of the tunnel. Figure 3 shows the development of the project through ten project appraisals over a period of 25 years. The scope certainly increased before stabilizing at approximately NOK2.5bn. The net present value was marginally negative in the first part of the front-end phase, when the scope was moderate. In the second part, three cost-benefit analyses commissioned by the government showed highly negative results, whereas two analyses commissioned by the privileged group concluded that the project would be profitable.

Changes in the terms of financing

An interesting observation is that in three of the case projects, the rules of the game were changed mid-way through the project. Measures to ensure accountability were introduced,

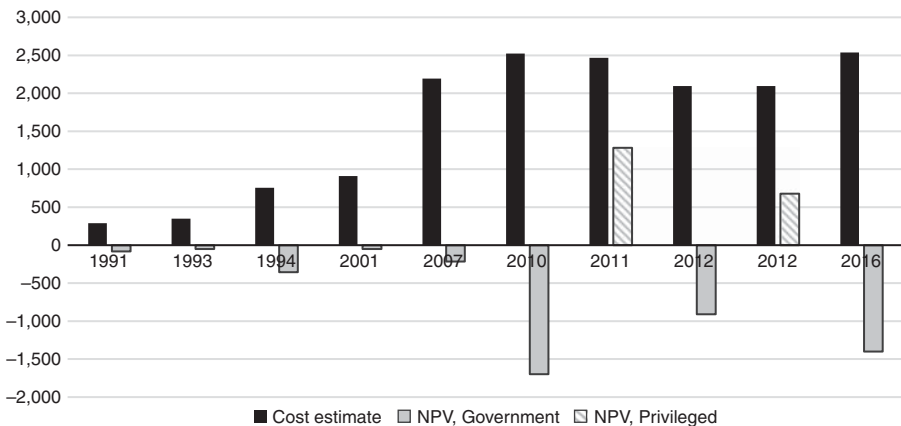
and the financial incentives were brought in line with government's objectives. In all three cases, there are clear indications that this was done to reduce the agency problems and that it actually managed to prevent or mitigate the most serious consequences.

In the Rock City case, the financial scheme was unclear from the start. The center and the municipality were hoping that the government and/or the county would reimburse any cost overruns related to the investment project and yearly deficits. The organizers of the center therefore chose a high level of activity, even after the revenues failed to materialize. Eventually the government terminated its funding. The municipality had no other choice than to take over, but after a few years, it decided to close down the center. Without this change, the center would probably have continued its activities with annual deficits covered by the state and the county.

A similar story can be told in the St Olavs Hospital case. Based on the experiences of other state-funded hospitals in previous years, the initiators at the county level (the owner of the hospital at the time), simply assumed that the national government would take responsibility for funding, and accept any cost increases after the *de facto* approval of the project. In the beginning they were correct. From an initial NOK1bn, the cost estimate increased to NOK12bn within a few years and would most likely have increased further, if the government had not, coincidentally, introduced an extensive hospital reform measure at the time. The reform implied that hospitals in Norway would no longer be managed by underfinanced counties but by regional health companies owned by the government with results-based funding. The St Olavs Hospital project had already been approved at the time, and the government therefore agreed to grant the NOK12bn as promised. To avoid further overruns, however, the new health company had to introduce considerable reductions in scope, and finally managed to complete the project at the budgeted cost.

The last case was the 1994 Winter Olympics. After the government's decision to guarantee the cost in 1987 based on an NOK1.8bn estimate, an organization that comprised the municipality, the Norwegian Olympic Committee and the Ministry of Culture was established to be responsible for further planning. The Ministry signaled that the government would fund the necessary improvements in the national transportation infrastructure and telecommunications/TV but that the other parties would have to fund the sports facilities and the various local infrastructures. However, this statement was not credible because the government had guaranteed to fund the whole event. The scope increased rapidly based on new needs and requirements identified by the municipality and the Norwegian Olympics Committee. Additionally, the International Olympic Committee

Figure 3. Stad Shipping Tunnel, ten project appraisals from 1991–2016; the first nine are based on Kvalheim (2015), and the last one is from the most recent National Transport Plan (million NOK, 2011)



had extensive detailed requirements and also acted an agent with adverse incentives. By 1989, the Ministry of Culture decided to reorganize the project and transfer responsibility to a new company owned by the state and funded by a block grant and economic incentives to comply with it. Thereafter, there were no further cost increases.

Discussion and conclusions

Findings and implications

Our nine case projects all differed with respect to, for example, size, complexity, the parties involved and sector. However, they were included in the sample because they had some characteristics in common: they were largely funded by the government, on a discretionary basis, with concentrated benefits for privileged groups. Moreover, all of the projects were large – not necessarily in absolute terms but certainly in relation to the privileged groups.

The following points summarize our answers to the research questions:

- (1) All the case projects were characterized to various degrees by conflicts of interest at the front end, often with the municipality in a key role. In most cases, the information about local conditions was clearly asymmetric. Thus, the risk of agency problems was clearly present in most cases.
- (2) We observed several signs of agency problems materialized. Early cost estimates were typically unrealistic, and the benefits to users and society were overestimated. It was surprising how much confidence the government had in the information received from below. Further, project initiatives that might have been sensible in the first place grew out of proportion and became over-dimensioned as a result of requirements the privileged groups introduced after the *de facto* approval of the project. Substantial resources were spent on lobbying.
- (3) The value for money was often meager and much lower than anticipated. The development aid project was extreme, wherein the gross benefits for the target group were negative. In the Norwegian projects, the value to the privileged group was generally positive but often low. In one case, the privileged group accidentally ended up with the bill and was forced into bankruptcy.
- (4) We conclude that perverse incentives were present in three cases. These projects were selected by the government because of the adverse incentives and represented a waste of public money.
- (5) The introduction of liabilities and incentives for cost control seems to have had a disciplining effect in three cases. Although they were introduced at a late stage when it was too late to stop the project, they probably led to the prevention of more severe problems.

The purpose of this study was to show how a simple framework of analysis based on agency theory can be used to explore the risk of perverse incentives at the front end of public projects. The comparison with development aid may seem inappropriate, but it worked well for the purposes of our study. In line with, for example, Eisenhardt (1989) and Biesenthal and Wilden (2014), we do not claim that agency theory is sufficient or that it should be used alone. However, it provides a useful perspective on project initiation that has rarely been applied in the project management literature. The absence of liabilities, such as co-funding, is a simple and obvious risk factor of which all project funders should be aware.

A timely question is whether these findings are relevant to the larger group of public projects in developed countries. This study does not answer that question, but we do know that in Norway, as in many other countries, there is a gap between the need for local infrastructure and the availability of local capital. This explains why, for example, local

roads, hospitals, universities and major sporting events are largely funded at the national level. Admittedly, hospital projects are no longer included among this group of projects in Norway due to the reform in 2002 that led to the establishment of health companies. Other projects remain in the high-risk category. Many transportation projects are partly funded by user fees, but the local share is often low, and as noted by Ostrom *et al.* (2001), for co-funding to provide the right incentives, there must be a link between the decision to initiate a project and the liability to pay. When a municipality or landowner initiates a project and sends the bill to motorists, this requisite is not met.

Countermeasures

The problems we have described in this paper do not necessarily have quick-fix solutions. There may be good reasons why the target group should be involved in the planning process while not putting its own money at stake. Still, much can be done in terms of improving the processes and systems related to individual projects. The potential for avoiding perverse incentives is much greater in a setting such as Norway compared with a country receiving development aid, about which Ostrom *et al.* (2001) concluded that the lack of well-functioning institutions is a serious obstacle.

Samset and Volden (2012) recommended that a thorough discussion of the terms of financing should be part of every project assessment. Agency theory can be used not only to identify the risk of perverse incentives but also to suggest how to mitigate it. From our Figure 1, it is apparent that the problem is created by the combination of conflicts of interest and information asymmetry. Thus, the solution should be twofold, as illustrated in Figure 4 and discussed below.

First, measures are needed to improve the information flow in order to ensure that the government bases project selection on high-quality information about the problems, needs, benefits, costs and risks. As noted by Klakegg and Volden (2016), the public sector depends on transparency as a means to strengthen accountability, whereas the private sector has competition. Conceivable measures would be to conduct third-party reviews of project proposals, give the general public an opportunity to express their views (e.g. through open hearings) and perform systematic *ex post* evaluations to learn about the level of impacts that can be expected.

Second, as much as possible, one should reduce the conflicts of interest between the government and privileged groups. Liabilities should apply both ways so that the privileged group has ownership of the project and is made accountable for the project's success. Solutions may be to require co-financing or local risk-taking, given that such requirements are credible, or to reward benefits realization *ex post*. Much of the literature on incentives in development aid focuses on how aid can be used as both a carrot and a stick. Ostrom *et al.* (2001) discussed the incentive problems related to different aid modalities and argued that

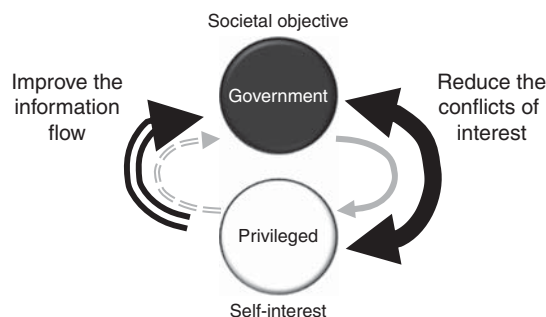


Figure 4. Measures to solve the problem of perverse incentives

loans have advantages over pure transfers for which no repayment is required, given that ownership is sufficiently rooted.

An even better solution would be to avoid the system of discretionary project-based funding of individual projects. As noted by de Rus and Socorro (2010), the most high-powered incentive scheme would normally be fixed-price contracts. In relation to our projects, this would mean a lump sum that the privileged group could allocate freely. This approach would be in line with the recommendations of Rattsø (2003), who discussed the more general need to make municipalities accountable, and Flyvbjerg *et al.* (2003), who argued that the state should grant a general allocation (to the local administration or a state agency) and require that the project selection meet certain objective criteria, such as value for money.

However, in cases where the government does finance projects with concentrated benefits, it is crucial to have an overall project governance framework in place that takes the risk of front-end agency problems into account. In recent years, Norway and some other countries have introduced governance schemes that cover the choice of concept (Volden and Samset, 2017a). Since 2006, Norwegian Governments have required that the largest investment projects undergo an external quality assurance of the conceptual choice to ensure that they are based on real needs, that alternative solutions are considered and that their value for money is assessed (Volden and Samset, 2017b). It is too early to conclude whether the scheme has led to more successful projects, but it clearly has helped sift out some poor project ideas early in the process. For example, in recent years, the Norwegian Olympic Committee and municipal partners have twice applied for a state guarantee to again host the Winter Olympics (2018 and 2022). In both cases, the external reviewer found that the benefits were overestimated and the costs underestimated, which led to the government rejecting the proposals. By contrast, the Shipping Tunnel is now being realized despite having been exposed to an external quality assurance evaluation. The external review was conducted in 2012, but as noted above, that was probably too late since the government had already *de facto* approved the project.

The Norwegian quality assurance scheme attaches great importance to providing transparency, controlling the quality of analyses and making all project information publicly available. However, it does not require co-funding or include any other measures to reduce conflicts of interest. Some other countries have introduced stricter co-funding requirements in their project governance schemes (Volden and Samset, 2017a). For example, the Dutch scheme requires co-funding from local authorities that come forward with a project proposal, and it requires that all investment initiatives in excess of EUR60m have private co-funding. The rationale is that this will result in more weight being attached to long-term revenue flows as well as efficient project implementation.

Limitations and future research

In all case-based studies, there is a risk of subjective bias. Researchers start out with some hypotheses that they try to confirm through the cases. This is especially true for studies that apply purposive sampling. However, Flyvbjerg (2006) noted that the question of subjectivism and bias applies to all methods, including, for example, the choices of categories and variables in a quantitative study and the structure of a questionnaire. Flyvbjerg stated that the case study contains no greater bias toward verification than other methods. On the contrary, experience indicates that the case study contains a greater bias toward falsification of preconceived notions.

Perhaps the most severe limitation of our study is that we have largely referred to the national government as one internally consistent unit and downplayed the way politicians and bureaucrats enter and leave the picture. Political decisions are clearly made through processes in which agreements about the goals and fundamental assumptions cannot be taken for granted (O'Leary, 2012), and in which there are many examples of irresponsible behavior, even

at the top level (Miller and Hobbs, 2005). Future studies should explicitly extend the model presented in this paper to include principal–agent relationships at the government level.

Another question that we have largely ignored here is whether different motivations for the use of government funding (e.g. distributional, wider impacts beyond local effects or insurance) require different measures to avoid agency problems. Still another question, which will have to be answered empirically, is whether perverse incentives in a certain sector merely lead to a suboptimal project portfolio or whether the total number of projects also puts pressure on overall budgets. In the latter case, there is a common-pool problem that might require specific measures.

There is no doubt that more research is needed on perverse incentives in order to learn more about the mechanisms involved, the scope of the problem and countermeasures that may work in various contexts, as well as how agency theory can best be combined with other theories.

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