# Financial Contracting with Non-governmental Organizations

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# Abstract

This dissertation investigates how *specific design choices or procedural rules* that govern the contracting environment between government and non-governmental organizations affect organizational behaviour and contractual outcomes. Chapter 1 studies government procurement of a public good or service when only *nonprofits* compete. Theoretically, I find that the intensity of the ideological divide between government and nonprofits jointly impact the degree to which compromises are made in terms of both the public's and nonprofit's missions, as well as the ability on the part of government to reap double (cost-saving and strategic) financial gains. Chapter 2 analyses government procurement of specific development aid services via competitive scoring auctions, open to nonprofits and for-profits alike. Consistent with the theoretical predictions, I find robust empirical evidence that *ex post* renegotiation costs as well as initial price offers will tend to be higher when the agent is a for-profit compared to when the agent is a nonprofit; at the same time, the initial offers of for-profits will on average adhere better to the government's service delivery instructions compared to those of nonprofits. Furthermore, because nonprofits intrinsically value project outcomes, they will at times be able to offer government a better deal; at the same time, this distinct feature of nonprofits also gives them a competitive disadvantage when government holds strong views about how the services should be provided and finds it important that the agent does what it says. Finally, Chapter 3 shifts attention to the actual *grant contracting procedures* used by government (and other grant-making institutions) to finance nonprofits' initiatives to provide a public good or service. I focus on how asymmetric information impacts nonprofits' behaviour in markets for individual grant contracts. Theoretically, I make explicit the argument that hidden types may be associated with excessive grant requesting, and demonstrate how a collective contracting mechanism can essentially alleviate grant market failures due to adverse selection.

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# Introduction

This dissertation considers the intriguing – and growing- use of *competitive market forces* by government to involve non-governmental organizations in the delivery of public goods and services. Governments are increasingly moving to delegate the delivery of a wide array of vital services, previously provided in-house, to non-governmental organizations through *competitive* (scoring) auctions (procurement contracts) and *competitive* requests for grant proposals (grant contracts). The adoption of these two 'market design' formats has proceeded apace in the real world, however, with surprisingly little systematic understanding of how their *specific design choices or procedural rules* affect the contending organizations' behaviour and contractual outcomes.

Chapter 1 studies government procurement of a public good or service when only *nonprofits* compete. Such a setting typically arises when the contracted-for good or service is purely public or collective (like regional economic development programmes), excludable but the intended recipients cannot afford to pay for the good or service (like food aid or health care for the poor), when the risks for *ex post* expropriation are high (like mental health care), or when nonprofits enjoy a competitive advantage over for-profits, often mediated through a series of preferential legal and public policy measures (see e.g. Hansmann, 1980; Rose-Ackerman, 1996; Tuckman, 1998; Glaeser and Shleifer, 2001; Francois, 2003; Yang, 2006). Recent evidence in the UK suggests government procurement from nonprofits is fastly gaining favour: grants represented 52% of government funding to nonprofits in 2001/02, but only 38% in 2004/05. Contracts, on the other hand, have increased from 48% in 2001/02 to 62% in 2004/05 (UK Voluntary Sector Almanac, 2007). Likewise in the US, government contracting is today the most important form of government partnering with nonprofits (Millstein, O'Regan and Oster, 2000).

The rising trend of government contracting with nonprofits poses interesting challenges. One central issue revolves around the question whether government's gains from "buying" (versus "making") justify her loss of control over the contracted-out service, possibly

jeopardizing key public interest values.[1] The more difficult it is to effectively stipulate, manage and monitor contractor's behaviour ánd the larger the value differences between government and nonprofit contractor, the more pertinent this agency problem becomes.[2] Much of the existing literature focusses on providing a public framework of accountability when government 'privatizes' functions or activities that have been public (see e.g. Minow, 2003). Here in Chapter 1, I instead analyse how public and nonprofit value compromises actually emerge and which factors, including those related to contract design, determine their size.

I provide a simple model of competitive tendering for a single, lumpy public service contract with two types of competing nonprofits, that is two competing nonprofits with distinct *missions*. Whereas the baseline model assumes complete information, perfect contract enforcement and service lumpiness, extensions of the model relax each of these assumptions. Theoretically, I establish three important results. First, the stylized competitive procurement procedure under study[3] allows government to reap not only cost-saving gains (as conventionally assumed), but also strategic financial gains. The more the two competing nonprofits differ in ideology, mission or identity, the greater these strategic financial gains. Intuitively, the prospect of losing a service contract to a more ideologically far-away nonprofit is much less appealing (that is, a lower valued outcome) and thus motivates competing nonprofits to compromise even further on their own (nonprofit) mission and accept transfer payments far below true costs.[4]

Second, the problem of imperfect contract enforcement imposes extra pressure on government to undermine public values, precisely because the risks of contract repudiation ultimately rest on how far the public-private contract requires a nonprofit to go back on her ideals. When there is asymmetric information about nonprofits' true costs of provision, a nonprofit's bid signals this true cost, but more than that, the bid also reflects the level of the *ex ante* fixed transfer payment, the degree to which the nonprofit's mission differs from its competitor and the extent to which the two rivaling nonprofits are close cost competitors.[5] Interestingly, when the two rivaling nonprofits are close cost competi-

[1] This is arguably the most controversial and least understood challenge. Lack of competition by geographic market and service type or lack of adminstrative capacity in government agencies also challenge the efficiency of government contracting, albeit in a much more straightforward manner.

[2] Let me illustrate what I mean by 'value differences' with the following examples. A mission-motivated nonprofit may wish to provide services of higher quality but lower quantity than may a government concerned with cutting costs or broadening eligibility.

[3] I provide a stylised model of the standard procurement procedure that is most widely by governments across the globe.

[4] Perhaps not surprisingly, under competitive tendering with complete information, the equilibrium contractual outcome deviates from the Pareto frontier. If instead the three parties (government and nonprofits) collectively bargained with (costly) transfers over the optimal service contract (al)location, then the contracting outcome would be (by definition) Pareto efficient.

[5] Now, I essentially adapt the conventional first-price sealed-bid auction setup to consider bids for a

tors and have outspoken and opposing identities, then government can set the minimum transfer payment relatively lower without disincentivizing nonprofits to bid.

Finally, none of these results rely on the assumption that the public goods project is lumpy. However, when we consider the possibility of contracting a divisible project to multiple nonprofits, the justification for government to demand ideological compromises from the nonprofits may in fact be lessened if not eliminated outright.

The analysis in Chapter 1 can explain why it might be efficient for government to undermine public sector values when contracting with nonprofits. That is, the analysis provides an efficiency rationale for a government who restricts transfer payments to the nonprofit contractor at the expense of public value compromise. Furthermore, it can explain why "government contracts with nonprofits often include as a standard feature pricing below cost (Miller, 2006)." The results also suggests that certain institutional factors like improved contract enforcement and improved government information about nonprofits' true cost of service delivery have desirable features because they act to limit the size of public value compromise.

Identity considerations, notably ideological differences with government and rivaling nonprofits, can evidently have implications for a nonprofit's optimal bidding strategy, and consequently the public-private partnership outcome (see e.g. Akerlof and Kranton, 2000). So far, my focus has been on procurement settings where *nonprofits only* compete. Increasingly, however, for-profit *and* nonprofit organizations compete for the same government contracts.[6] Since the identity of nonprofits and for-profits differ by definition or by law, it is pertinent and intriguing to ask how this difference plays out in an open, mixed competitive contracting environment with government. I study this issue in the next Chapter.

Chapter 2 analyses government procurement of foreign aid services via competitive scoring auctions, open to nonprofits and for-profits alike. In foreign aid procurement,[7] it is not uncommon for nonprofits and for-profits to bid on the same "requests for proposals," stipulated by bilateral or multilateral aid agencies like USAID or EuropeAid. Based on tabulations of the USAID (2001) *Yellowbook*, a description of USAID contracts with

*public* goods project, in which the nonprofits' optimal bidding strategies are distinct from bids in the more familiar *private* goods' auction setting.

[6] In many markets, nonprofit providers of services function alongside for-profit providers. As an example, in the US, child day-care centers ar roughly 60% nonprofit and 40% for-profit, with the nonprofit numbers containing a small number of publicly run centers (Morris and Helburn, 2000). The encroachment of for-profits in social service industries that had traditionally been nonprofit domains increases the level of competition for government service contracts.

[7] Government procurement in markets where nonprofits function alongside and for-profits is of course not limited to foreign aid. Examples abound in other sectors such as local government contracting for public health services as well (see e.g. Yang, 2006).

outside actors, Werker and Ahmed (2007) find that of nearly $20 billion in open USAID contracts, $10 billion had been awarded to for-profits and $7 billion to nonprofits, with the remainder to an assortment of governmental and other nonprofit actors. Despite the fact that it is a vast and thriving business, aid procurement is often perceived as an obscure topic when it comes to reducing poverty. But, in the mundane details of *how* and *with whom* government contracts to build schools, drill water wells or support a national anti-corruption strategy, Chapter 2 shows, can be found important opportunities for saving public resources and promoting a more dynamic private sector involvement in developing countries.

When aid procurement makes headline news, it mostly does so airing concerns about too much of official aid money allegedly being swallowed in fees and administrative costs with *profit-seeking* contractors. To illustrate, consider this recent quote from the Financial Times (2008): "The international aid effort in Afghanistan is in large part "wasteful and ineffective", with as much as 40 percent of funds spent going back to donor countries in corporate profits and consultant salaries, Kabul-based charities only recently announced." Despite such worries (placing especially for-profit contractors in a grim spotlight), nobody, to the best of my knowledge, has so far sought to systematically establish whether for-profit contractors behave any differently from nonprofit contractors. Do for-profit contractors effectively demand relatively higher fees, and if yes, in exchange for what? In other words, what's in it for government? How is it that for-profit contractors might be able to charge bilateral or multilateral aid agencies relatively higher prices? These are the sorts of questions I examine first theoretically, and then empirically using a novel dataset that I constructed myself with detailed information about forprofits' and nonprofits' bidding and contracting decisions for over 450 competitively awarded aid service contracts let by the UK's Department for International Development, one of the most highly regarded bilateral aid agencies worldwide (The Economist, 2002; Barder, 2005).

In Chapter 2, I first develop a simple model of competitive bidding for inherently incomplete aid service contracts with two types of contestants -now, for-profits who simply maximize profits and nonprofits with a distinct mission, who care about the project's outcomes and the ways these outcomes came about.[8] I show that nonprofits will typically compete for aid service contracts where there exist high returns to non-contractible quality innovations (as is often the case in projects with a strong public goods component), government finds strict adherence to the initial "Terms of Reference" (TOR) relatively less important and/or nonprofits reap substantial intrinsic gains from project realization. Yet these strengths of nonprofit status also produce corresponding weaknesses in

[8]Like in Chapter 1, nonprofits explicitly value the project's outcomes. But now in contrast to the modelling assumptions in Chapter 1, nonprofits reap no project benefits unless they are in effect the project contractors.

agenda-setting: the initial offers made by nonprofits will, on average, adhere less to the project's TOR than the initial bids submitted by for-profits. Finally, the government's *ex post* transaction costs when contracting with a for-profit will on average be substantially higher than when contracting with a nonprofit. Intuitively, a for-profit will exploit any renegotiation opportunity to increase its profits, whereas a nonprofit will use the opportunity to take control over the project's design and implementation approach.

I test these three main empirical predictions of the model using a unique data set containing detailed information on 458 competitive aid service contracts awarded by the UK government (the UK's Department of International Development, to be precise) to 225 distinct aid implementing firms. I find support for all three predictions. E.g. nonprofit bids effectively adhered less to the projects' TOR than did those made by for-profit, and for-profits were significantly more likely to request additional funds to complete their projects (due to cost overruns and the like) after the contract had been signed. The average total cost overrun (as a share of the initially agreed price offer) with a for-profit contractor was nearly twice as high as its counterpart with a nonprofit contractor.The analysis in Chapter 2 thus provides a rationale for why for-profits can charge substantially larger fees (both ex ante and ex post) than nonprofit rivals, and still win the contract; and why nonprofit *mission* can help to win an aid contract, but can at times[9] also be a liability.

In Chapters 1 and 2, I analyse how precisely nongovernmental organizations, be it for-profits or nonprofits, respond to the competitive market structures that are most widely used by government to procure specific, well-defined services from these third parties. What is their optimal bidding and contracting strategy, and how do the procedural rules that govern these procurement settings affect these choices? Both Chapters reveal that the identity of the contractor and his competitors matters a lot, that is, has far-reaching consequences for the nature of the contractual deal that government and nongovernmental organization strike. The next and final Chapter of the Dissertation turns to yet another widely used method by government (but also by other grant-making institutions) to engage with nonprofits for the delivery of public services: competitive requests for individual grant proposals. Here, however, I not only briefly analyse how nonprofits respond to the *standard* grant-making mechanism, I also advance a new alternative mechanism, specially designed to help the grant-maker more effectively deal with the growing and costly problem of adverse selection.

So Chapter 3 shifts attention 'back' to the actual *grant contracting procedures* used by

[9] For instance, when government knows what she wants (how the project should be implemented), then a for-profit's greater willingness to do what government wants (that is, dance to the piper) is a source of competitive advantage.

government (and notably also other grant-making institutions) to finance nonprofits' initiatives to provide a public good or service. Over the past few years, markets for grant finance have in effect proliferated and become increasingly *thick,* with an ever larger number of potential grant recipients interacting with a growing number of grant-making institutions, largely due to a historic rise in philanthropy.[10] Despite this, remarkably few, practical mechanisms have at the same time evolved to help grant-making institutions overcome both the *congestion* that thickness can bring and the inherent *screening difficulties* that thickness can aggravate. These markets are virtually all organized via competitive calls for *individual* project proposals. Chapter 3 presents, to the best of my knowledge, the first scholarly effort to rethink the way grant-making agencies screen grant proposals and allocate grant funds.

I study a new grant contracting method, a so-called *collective grant contracting mechanism*, that departs from the *status quo* grant-making practices in two material ways. The new method requires candidate grantees[11] to form a group of a prespecified size and submit one collective grant proposal, which pools together individual grant requests. The collective grant contract also specifies a series of distinct and critical individual achievements, i.e. significant stages in each project's development process, and conditions an individual's future stage grant payments not only on defined individual results but also on the achievements of the other group partners. Assuming that grant applicants effectively have some valuable information about each other's projects which the grant-making agency does not (readily) have, I show that this joint liability transfer will induce positive assortative matching, and raise the average quality of the organizations or projects who apply. Indeed, the collective grant contracting can be viewed as a simple mechanism that exploits local information to alleviate grant market failures caused by asymmetric information. Furthermore, the collective grant contracting mechanism, I argue, can significantly reduce transactions costs, that is, the administrative burden of allocating grants.

The collective grant contracting mechanism offers a number of important, additional benefits to grant-makers. For instance, it presents a way for grant-makers to reconcile competitive pressures with incentives to collaborate, enabling grant-makers to capture efficiency gains from both competition *ex ante* and mutual assistance *ex post.*[12] Also,

[10] Nonprofits today increasingly finance their activities not only through government partnering (grants and contracts) but also with private sector means. The growing success of Corporate (Social) Responsibility and the remarkable rise in the number of big, private foundations (see e.g. Gates Foundation and Soros Foundation) by and large account for this important trend.

[11] I assume that grant applicants in the analysis are *nonprofits* - that is, organizations who explicitly value the outcomes of the projects they implement. Since the overwhelming majority of private and public grant schemes are open to nonprofits only, this is a natural assumption to make.

[12] This relates back to the common worry raised earlier (in Chapter 1) that by pitting nonprofits in competition with one another, competitive market structures will destroy networks of mutuality and their

compared with the standard individual grant contracting procedure, it can more effectively benefit from reputational concerns as a disciplinary mechanism. At the same time, certain factors also raise difficulties with its implementation. For instance, the role of social ties is a priori ambigous. On the one hand, social ties can readily facilitate the flow of information about each others' true talent or ability. On the other hand, strong personal relationships can also stand in the way of the effective usage of such information during the group formation process. I conclude the Chapter with a discussion of two concrete grant-making settings as compelling testing grounds for the collective grant contracting mechanism: international development grant-making and grant-making targeted at new, innnovative nonprofit initiatives.

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contribution to welfare (Goodin, 2003).

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# Chapter 1

# Nonprofits and Public Good Provision: A Contest Based on Compromises

## 1.1 Introduction

Government agencies are increasingly moving to delegate a wide array of vital services, previously provided in-house, to private (both nonprofit and for-profit) organizations. Efficiency and effectiveness concerns similar to those that have driven the wave of privatization initiatives over the last two decades have motivated the formation of these "public-private partnerships" (Anheier, 2005; Morris, 2000). Furthermore, the procurement of these social and other services is commonly performed utilizing competitive tendering systems. Like other production contracts (Hart, 1983), competition for public sector contracts is expected to lead to innovation, flexibility, superior productivity and cost reductions (Smith and Lipsky, 1993; Weisbrod, 1998; Stein, 2001; Salamon, 2002; Minow, 2003). In this chapter, I ask how competitive tendering for public sector contracts in nonprofit marketplaces affects the goals of nonprofits, their financial condition, their behavior in the marketplace, and their ability to carry out their goals. These questions are especially important as they touch on the viability and desirability of competitive procurement schemes targeted at nonprofit organizations to ensure improved, effective service delivery outcomes.

Raising funds to achieve an organization's mission and objectives has in recent years become an intensified competitive venture (Brown and Slivinski, 2006). A dramatic rise

in the number of nonprofit agencies contending over finite, limited amounts of external support, the novel presence of for-profit firms in social service industries that had traditionally been nonprofit domains, and the shifting of government funding have also prompted organizations to diversify their revenue sources (Anheier, 2005). A recent literature attempts to understand the details of fundraising strategies that arise in competitions for *private* donations (Andreoni, 1998, 2006; Vesterlund, 2003; Frumkin and Kim, 2000), differences in firm behavior within mixed industries (Ballou and Weisbrod, 2003; Kapur and Weisbrod, 2000; Weisbrod, 2004) and how these differences are impacted by the level of competitiveness (Duggan, 2002; Bertrand et al., 2005). This chapter shifts focus in two important ways: First, I question the rationale of bidding strategies that arise in competitions for *public* funds.[1] Second, I consider the scantily studied competitions for public sector contracts in settings where only nonprofits compete.[2] This focus helps us formally draw out the implications of incongruent missions between public and private agencies and among private agencies for the contractual arrangements between public and private nonprofit entities.

The actual procurement procedures followed by public agencies at local, regional, national and international levels entail a fairly uniform set of practices. Typically, the relevant public agent publicizes a contract or grant notice, which indicates the desired outputs or services and the amount of available funds. Private organizations, possibly short-listed candidates, respond to the announcement with a formal bid, which details amongst other things the proposed strategy, methodology and costs. Finally, an external committee evaluates the submissions and allocates the contract or grant to the winning tenderer. Examples abound: City councils increasingly delegate, for instance, the design of a local economic development program to a private expert agency on a competitive basis. Also, international development agencies award gradually more aid grants and specific project contracts after a similar tendering process.[3] The oft lumpiness of the public goods service

[1] In the US, UK, Canada, Japan, Germany and many other countries, the nonprofit sector significantly relies on government for funding (Salamon et al., 2003). The great majority of nonprofit revenue is either through earned income or government grants and contracts (Anheier, 2005). In recent decades, private donations have accounted for roughly one fifth of the revenues of the nonprofit sector in the US (Weitzman et al., 2002).

[2] Typically, such exclusively nonprofit markets occur when the goods or services produced are purely public or collective, such as regional economic development programs; when the goods or services are excludable but the intended recipients cannot afford to pay, like food aid and health care to the poor; or when the nonprofits enjoy a competitive advantage over for-profits, often mediated through a series of preferential legal and public policy measures (Hansmann, 1980; Rose-Ackerman, 1996; Tuckman, 1998; Glaeser and Shleifer, 2001; Francois, 2003; Yang, 2006). Cooperative relations between governments and nonprofits in welfare provision have become a prominent feature in countries such as the US, Germany, France and the UK (Anheier, 2005).

[3] Agencies such as USAID, the UK's Department for International Development, EuropeAid and the World Bank's International Development Association apply competitive procurement procedures very similar to the one outlined here. Though for the majority of the competitively let aid service contracts at least one for-profit bids, a significant share of competitions for aid involve nonprofits only (Huysentruyt,

and limited public monies command the fair selection of one candidate only.

Critics of the state-nonprofit contractual relations forward three distinct concerns. First, many fear that private, and especially religious, nonprofit providers can be co-opted or their motivational and organizational distinctiveness undermined if they embrace and compete for ties with government. It is a common worry, among nonprofits, that simply taking public money makes them susceptible to political control, censure or influence that diminishes their autonomy, dismantles their flexibility and responsiveness and interferes with their self-determination. It is also a common worry that simply delivering the services of government's choosing subtly changes the organization's priorities and distorts the nonprofit's fundamental ethos or original social mission. There is evidence of both of these worries (Smith and Lipsky, 1993; Rose-Ackerman, 1996; Wallace et al., 1997; Pipes and Ebaugh, 2002; Young and Salamon, 2002; Goodin, 2003; Smith and Gronbjerg, 2006; Minkoff and Powell, 2006). Second, the flip side of this concern for protecting the private realm is the crucial importance of articulating and maintaining public values (Minow, 2002). It is feared that increased government contracting of services to nonprofits can jeopardize public purposes and public commitments to equality (of treatment), freedom, fairness and democracy. The third concern relates to the distinctive accountability regime of the nonprofit sector as a whole (Goodin, 2003). By pitting nonprofits in competition with other nonprofits, the competitive tendering process can destroy the networks of mutuality, and their contributions to social welfare. In so doing, the competition undermines cooperation, the distinctive element of the nonprofits' accountability regime, and the contribution that can make toward democratic accountability of social institutions overall.

Despite widespread use of *grosso modo* a single, simple procurement procedure and a strident ideological debate about public-private partnerships and whose compromise is at stake, surprisingly little attention has been paid to the question of how *contract design choices* might affect rivaling nonprofits' bidding behaviour, the value compromises, and the contractual outcomes. In this chapter, therefore, I provide a simple model of competitive bidding with two types of nonprofits (that is, two nonprofits with distinct missions) that elucidates which *factors* importantly shape/determine any contractual agreement between government and nonprofit. First, I provide a basic model of public-private partnership under perfect information. I show that the competitive procurement procedure readily allows government to reap not only (conventional) cost-savings gains, but also strategic financial gains. The more the two competing nonprofits differ in ideology, mission or identity, the greater those strategic financial gains. The intuition is that the

2007). In other words, we find that certain segments of the aid marketplace (particularly, in the fields of social services and health care) are dominated by nonprofits only, for reasons summarized in the previous footnote. Also, a large number of grant schemes explicitly target nonprofits only.

possibility of losing the contract to a radically different nonprofit is so unattractive (that is, reservation utility is so much reduced) that it leads a nonprofit to go through extra lengths (specifically, further compromise its own mission and accept a lower transfer payment) solely to preempt this. I also show that under perfect information, cooperative bargaining with (costly) transfers actually presents a more efficient *contract allocation procedure* than the competitive prcocurement format under focus.

Next, I extend the benchmark model in two material ways. First, I incorporate the possibility of imperfect contract enforcement. I argue that so long as the ideological preferences of the nonprofits and the public agency continue to diverge, any public service contract that deviates too much from a nonprofit's own mission runs the risk of contract repudiation. Here, it may in fact make sense for public values to be further undermined and nonprofit ideologies resurrected/accepted, precisely because the risks of contract repudiation ultimately rest on how far the public-private contract requires a nonprofit to go back on her ideals. Second, I allow for the possibility that government contracts multiple projects to multiple nonprofits. I demonstrate that our key insights are not an artifact of the fact that the public good in question is lumpy. Furthermore, I show that in alternative circumstances where the public agency can gainfully contract out multiple public goods to multiple nonprofits, the justification for the public agency to demand ideological compromises by nonprofits may in fact be lessened if not eliminated outright.

Finally, I derive the nonprofits' optimal bid when there is asymmetry in information about their true costs of service provision. I show that any compromise in (nonprofit) mission is now proportionally (but not one-to-one) decreasing with true delivery costs and monotonically increasing with the extent that the two rivaling nonprofits are close cost competitors and radically differ in mission, and the size of the transfer payment. As in the previous cases, government can effectively impact/manage the size of public value compromise through her decision over the level of ex ante specified transfer payment. My analysis also shows why competing for a public service contract can be harmful from the winning nonprofit's viewpoint: Indeed, under certain conditions, the winning nonprofit would actually have been better off under pure public service provision.

The remainder of the chapter is organized as follows. In the next section, I examine the public project's outcome under pure public provision, that is, the benchmark case where the public agency delivers the public service on her own without nonprofit collaboration. Section three lays out the basic model of a public-private partnership under perfect information; nonprofits' production costs are common knowledge. Section four scrutinizes the welfare implication of competitive tendering. Section five extends the basic model and relaxes assumptions with respect to (i) imperfect contract enforcement, (ii) the lumpiness of the public good and finally, (iii) information asymmetry. These findings uncover how

the degree of ideological compromise in a public-private contract is systematically related to the public agency's ability to enforce contracts, to provide the public good on her own, and to discern the cost-efficiency of the nonprofits. Section six concludes.

## 1.2 The Model

### 1.2.1 Citizens' Preferences

Let the size of the population of citizens be normalized to one. Citizens have heterogeneous preferences over the location of an indivisible public good.[4] Specifically, our analysis builds on a spatial-differentiation model (Hotelling, 1929) in which citizens are uniformly distributed along a "linear city" of unit length (Figure 1). Let $x_c$ denote a citizen's distance from the left, where $x_c$ also gives the citizen-specific preference of where an indivisible public good should ideally be located along the $[0, 1]$ interval.

The citizens' utility from the project is given by a common factor $\theta$. The utility cost associated with not consuming one's most preferred project depends on a unit *transportation* cost, $t \geq 0$.[5] Taken together, the utility of a citizen located at distance $x_c$, when the public good is located at distance $x_i$, is given by:

$$W(x_c, x_i) = \theta - t|x_c - x_i| - k \quad (1)$$

where $k$ denotes a lump-sum tax paid by each citizen to finance the public good.

### 1.2.2 The Public Agency

We consider a benevolent public agency, whose objective is to maximize net social welfare, consisting of the sum of each citizen's utility, net of the cost of financing the project. Since the social (actual plus transaction) costs associated with raising a pound can be greater than a pound, we introduce a marginal cost of public funds, $\lambda \geq 1$.[6]

[4] The line segment can also be viewed as physical distance, an individual's political and/or religious beliefs or ideology.

[5] The notion of voting with one's feet (Tiebout, 1956) is likewise applicable. Here, the transportation cost $t$ should accordingly be interpreted as the cost of moving away from one's ideal location in order to adapt to the realized location of the public good.

[6] This characterization of government's preferences is consistent with the views (i) that a government may be forced to act according to the ideological views of the citizens in order to preserve voter loyalty (Persson and Tabellini, 2000). Or (ii) that decision over the optimal delivery of the public goods is based on the preferences of the policy maker in power. This representation of the government has been coined

### 1.2.3 Nonprofits

Two nonprofits, labeled $i = 1, 2$, constitute the third set of stakeholders. Each nonprofit is capable of providing the public good at cost $c_i$. In terms of the location of the public good, each nonprofit has an exogenously given ideological preference, located at the far left (0) and right (1) endpoints of the $[0, 1]$ interval respectively for nonprofits 1 and 2.

The difference between the nonprofit's equilibrium choice of the location of the public good and his ideal location will be interpreted as a measure of "ideological compromise" generated by the competitive process. The cost of such locational deviation from the ideal will be denoted by the common unit transportation cost $\tau$, and $\tau\times$ (distance away from its initial ideological position) reflects a nonprofit's utility cost whenever the public good is positioned at a location distinct from its ideal.[7]

The utility functions of the two nonprofits, when the public agency contracts with nonprofit 1 for the public good to be provided at location $x$, are thus given by

$$W_1(x, B_1) = \theta_1 - \tau x + T_1 - c_1, \quad W_2(x, 0) = \theta_2 - \tau(1 - x)$$

$\theta_i$ denotes the nonprofit-specific valuation of the project's benefits. $B_1 \equiv T_1 - c_1$ denotes nonprofit 1's net monetary benefits of collaborating with the public agency, as given by public agency to nonprofit transfers $T_1$ over and above the costs of the public good $c_1$. When partnership is struck with nonprofit 2 at the same location, however, the utilities of the two nonprofits are

$$W_1(x, 0) = \theta_1 - \tau x, \quad W_2(x, B_2) = \theta_2 - \tau(1 - x) + T_2 - c_2.$$

To clarify, these utilities are simply derived from the underlying preferences of the organization's managers (and employees and volunteers).[8]

### 1.2.4 The Economy

Finally, I embed the three-entity model (beneficiaries, financier and provider) in a more complete description of the economy. A constitution provides for the election of a citizen with the power to tax. The resources to finance the public goods project are raised

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the citizen-candidate model (Besley and Coate, 1997). Both models lead to the same results if it is the case that the politician's preferences are reflective of the median voter's preferences, and when median and mean coincide.

[7] For example, faith-based organizations arguably face relatively high unit costs $\tau$.

[8] Because of the non-distribution constraint (Hansmann, 1980), a nonprofit organization is able to attract and recruit altruistic employees working towards ideological, rather than financial, ends.

through a lump-sum income tax. The tax burden is borne by citizens only. The nonprofit is not taxed and, consequently, does not take the tax burden into account when making decisions.[9] For the government budget to be in balance, total tax revenue $T$ must equal total investment costs of the public goods project, plus the transaction costs of raising public funds.

### 1.2.5 Pure Public Provision

I begin with an examination of the public project's outcome under pure public provision, that is, without nonprofit-collaboration. In this benchmark case, the public agency faces a two-stage problem: (i) whether the public goods project should be provided at all, and conditional upon providing the public good, (ii) its optimal location.

Starting from the second stage, the public agency chooses a project location, $x_g$, that maximizes net social welfare under pure public provision $W_g^0(x_g)$, with

$$\begin{aligned} W_g^0(x_g) &= \int_0^{x_g} \theta - t\,(x_g - x)\,dx + \int_{x_g}^{1} \theta - t\,(x - x_g)\,dx - \lambda c_g \\ &= \theta - t\left(x_g - \frac{1}{2}\right)^2 - \frac{1}{4} - \lambda c_g \text{.....(2)} \end{aligned}$$

The first two terms on the right-hand side of equation (2) respectively measure the project's benefits accruing to those citizens to the left and to the right of the project location. The last term denotes the government's costs of providing the public good. By inspection, $W_g^0(x_g)$ is strictly concave and twice continuously differentiable, and the public agency's unique ideal project location is simply $x_g^0 = 1/2$. Indeed, the term $t\left(x_g - \frac{1}{2}\right)^2$ expresses the welfare cost of locating the public good either to the right or the left of $x_g^0 = 1/2$.[10]

Implementing the public project at $x_g^0 = 1/2$ is socially desirable if and only if

$$W_g^0(\frac{1}{2}) \geq 0 \Leftrightarrow \theta - \frac{t}{4} - \lambda c_g \geq 0 \text{.....(3)}$$

[9] In the US, for instance, nonprofits committed to community benefit and charitable purpose enjoy a tax-exempt status. Nonprofit organizations do, however, engage in a range of income-producing activities. To the extent that such activities are "substantially related" to the organization's tax-exempt purpose, the income is tax-free (and the associated expenses are essentially non-deductible). By contrast, net income from "unrelated business activities" is subject to the Unrelated Business Income Tax (UBIT), which generally taxes such income at ordinary corporate (or trust) tax rates (Brody and Cordes, 1999).

[10] We have implicitly limited the public agency's optimization problem to the identification of one optimal location. The case wherein multiple public goods may be provided in multiple locations will be discussed in Section 5.

As may be expected, the public agency's welfare $W_g^0(x_g)$ rises as the magnitude of common benefits, captured by $\theta$, increases; and decreases as a result of increased production costs ($c_g$), costs of funding ($\lambda$), and citizens' transportation costs ($t$).

## 1.3 Public-Private Partnership under Perfect Information

I now turn to public-private partnership, in which the task of public service delivery is contracted out to one of the two nonprofits. Partnership opens up the opportunity for the public agency to exploit any cost advantages that nonprofits may enjoy in providing the public good. In exchange, the public agency is faced with the possibility of losing control over the project's ideological design.

Consider therefore a game with perfect information, staging three players: the public agency, and the two nonprofits. The public agency announces her plan to contract out public service delivery to a nonprofit. Assume without loss of generality that nonprofit 1 exhibits lower provision costs. The following sequence of events ensues:

1. The public agency offers a contract, consisting of a public good location and lump-sum transfer pair $\{x_1, T_1\}$ targeting nonprofit 1. The game ends if nonprofit 1 accepts the contract offer. If nonprofit 1 rejects, the game proceeds to the next stage.

2. The public agency offers another contract $\{x_2, T_2\}$ targeting nonprofit 2. The game ends if nonprofit 2 accepts. Otherwise, the game proceeds to the next stage.

3. The public agency decides whether or not to provide the public good on its own.

The extensive form game is thus finite and dynamic, and consists of three subgames, each of which, as established by Selten (1965) satisfies the hypotheses of Nash's Theorem. In Appendix A, I check that (i) the public agency is indeed better off contracting with the least cost nonprofit and (ii) staging the lower cost nonprofit in the first stage dominates the alternative where the higher cost nonprofit is staged first. I now proceed to characterize the form of the optimal contracts, reasoning by backward induction.

The smallest subgame contains the public agency's decision node. The outcome has already been worked out in Section 1.2.1, and depends in particular on whether $\theta \geq \frac{t}{4} - \lambda c_g$ is satisfied. Since my main goal is to uncover the rationale for public-private partnership,

as opposed to pure public provision, I shall assume henceforth that the social desirability condition ($\theta \geq \frac{t}{4} - \lambda c_g$) is satisfied. The associated payoffs of the three parties are

$$W_i^0 = \theta_i - \frac{\tau}{2}, i = 1, 2, \quad W_g^0 = \theta - \frac{t}{4} - \lambda c_g$$

Working backwards to the second stage, nonprofit 2 accepts the offer of the public agency if and only if pure public service delivery proves to be an inferior option:

$$W_2(x_2, T_2 - c_2) \geq W_2(x_g^0, 0) \Longleftrightarrow T_2 \geq c_2 + \tau(x_g^0 - x_2) \equiv T_2^*(x_2, x_g^0)$$

Evidently, the two types of compromises that a nonprofit can be called on to make, respectively locational ($x_2$) and monetary ($T_2$), are substitutes. In particular, if equation (5) is just binding, the public agency can save on transfers by designating the location of the public good to be closer to nonprofit 2's ideal at $x_2 = 1$. Importantly, the extent to which such savings can be achieved depends on the nonprofit's attachment to her ideology, with $\left|\partial T_2^*(x_2, x_g^0)/\partial x_2\right| = \tau$.

The optimal contract offered to nonprofit 2 solves the public agency's decision problem:

$$\begin{aligned} \max_{T_2, x_2} W_g^*(x_2, T_2) &= \max_{T_2, x_2} \theta - t\left(x_2 - \frac{1}{2}\right)^2 - \frac{t}{4} - \gamma T_2, \\ s.t. T_2 &\geq T_2^*(x_2, x_g^0) \end{aligned}$$

Like $\lambda$, the parameter $\gamma \geq \lambda \geq 1$ represents the marginal social cost of raising public funds, and includes additionally the costs of negotiation, and the designing and signing of contracts.[11]

Assuming henceforth that $\gamma T_2 < 1$, the optimal contract has an interior solution, with

$$x_2^* = \frac{1}{2} + \frac{\gamma\tau}{2t} \in (1/2, 1), \quad T_2^* = c_2 - \frac{\gamma\tau^2}{2t} < c_2$$

Thus, as long as the transportation cost of citizens relative to that of nonprofits ($t/\tau$) is no less than the marginal social cost of public funds $\gamma$, the contract stipulates that compromises are to be made by both the public agency and the nonprofit, as $x_2^*$ is greater than $1/2 = x_g^0$, but nevertheless to the left-hand side of nonprofit 2's ideal location $x_2 = 1$.

Note that the associated transfer payment to nonprofit 2, $T_2^*$, falls short of the nonprofit's total investment costs, $c_2$. The size of this monetary compromise is given by $\frac{\gamma\tau^2}{2t}$, and

[11] We introduce this distinction between $\lambda$ and $\gamma$ to reflect the circumstantial evidence that the precise institutional design of public services delivery affects the public agency's per unit investment costs. The logic of our results goes through unscathed if both parameters are taken to be equal, and/or equal to one.

represents payment by nonprofit 2 in exchange for the public agency's granting of a locational compromise, from $x_g^0 = 1/2$, to $x_2^* = \frac{1}{2} + \frac{\gamma\tau}{2t}$, at unit transportation cost $\tau$.[12]

For nonprofit 1, a failure to strike a contract with the public agency in the first stage necessarily spells a loss in control over the public project's location to nonprofit 2 if and only if the credibility criterion in equation (8) is satisfied:

$$W_g^*(x_2, T_2) \geq W_g^0(1/2) \Longleftrightarrow \lambda c_g - \gamma c_2 \geq -\frac{\gamma^2\tau^2}{4t}$$

Equation (8) requires simply that the public agency's net benefit from contracting with nonprofit 2 is non-negative.[13]

I proceed to the final subgame, featuring nonprofit 1's decision problem. If both the social desirability and the credibility conditions are satisfied,[14] nonprofit 1 will rationally agree to close a public-private partnership with the public agency if and only if

$$W_1(x_1, T_1 - c_1) \geq W_1(x_2^*, 0) \Longleftrightarrow T_1 \geq c_1 + \tau(x_1 - x_2^*) \equiv T_1^*(x_1, x_2^*).$$

Thus, the public agency once again has leverage over the amount nonprofit 1 may be underpaid ($\tau(x_2^* - x_1)$). The size of the underpayment can be increased by raising the difference between the locations specified in the two contracts ($x_1$ and $x_2^*$), and by a strong sense of mission and/or ideology on the part of the nonprofit (an increase in $\tau$), whenever $x_1 < x_2^*$. In stage 1, the public agency solves:

$$\begin{aligned} \max_{T_1, x_1} W_g^*(x_1, T_1) &= \max_{T_1, x_1} \theta - t\left(x_1 - \frac{1}{2}\right)^2 - \frac{t}{4} - \gamma T_1, \\ s.t. T_1 &\geq T_1^*(x_1, x_2^*). \end{aligned}$$

The welfare maximizing contract with nonprofit 1 stipulates:

$$x_1^* = \frac{1}{2} - \frac{\gamma\tau}{2t} \in (0, 1/2), \quad T_1^* = c_1 - \frac{\gamma\tau^2}{t} < c_1$$

assuming once again that $\gamma\tau/t < 1$. Thus, the extent to which the project's location

[12] If $\gamma\tau/t \geq 1$, we have $x_2^* = 1$ and the optimal amount of transfer accordingly adjusts so that $T_2^* = c_2 - \tau/2$. Once again, the total transfer falls short of $c_2$.

[13] As special cases, note that if $\tau/t = 0$ so that nonprofit 2 is in fact indifferent to the location of the public good, or that citizens' cost of transportation is extremely high, the public agency will never make any locational compromise and set $x_2^* = 1/2$. A necessary and sufficient condition for public-private partnership is accordingly that it be fiscally sound $\lambda c_g \geq \gamma c_2$. At the other extreme, with $\tau/t$ sufficiently large, the credibility criterion can be met even when $c_g$ is in fact strictly less than $c_2$.

[14] If equation (8) is not satisfied, however, the public agency will refrain from contracting with nonprofit 2, and chooses instead to provide the public good at cost $\lambda c_g$. The optimal contract struck between nonprofit 1 and the public agency is given by $x_1^* = 1/2 + \gamma\tau/2t$ and $T_1^* = c_1 - \gamma\tau^2/2t$ if and only if $\lambda c_g - \gamma c_1 \geq -\gamma^2\tau^2/4t$.

is removed from the public agency's ideal location (halfway along the $[0,1]$ interval) is determined by the ratio of transportation costs for nonprofits over those for citizens as well as the costs of funding ($\gamma\tau/t$). Only in the event of infinitely high citizens' transportation costs ($t$) or zero nonprofit's transportation costs ($\tau$), will the project be implemented halfway along the line segment ($x_1^* = 1/2$). Meanwhile, if in contrast $\gamma\tau \geq t$, the nonprofit's ideological attachment to her mission is strong enough that the public agency will demand no locational compromise, or equivalently, $x_1^* = 0$, and nonprofit 1's right to provide the public good is won over based only on monetary concessions, with $T_1^* = \tau(x_1 - x_2^*) + c_1 = -\tau + c_1$.[15]

In all cases, the level of transfers $T_1^*$ that the public agency offers (and is accepted by nonprofit 1) falls short of nonprofit 1's provision cost $c_1$. This discrepancy between the transfer payment and provision costs increases with the costs of funding, $\gamma$, the nonprofit's transportation costs, $\tau$, and diminishes as the citizens' transportation cost $t$ rises. From the government's perspective, higher transactions costs ($\gamma$) are to be compensated via a lowering in the amount of transfers. Meanwhile, higher transportation costs $t$ on the part of citizens motivate an increase in the level of transfers so as to secure a project location not too far from the midway point. Finally, higher transportation costs $\tau$ on the part of nonprofits lower the size of transfers, as each nonprofit's motivations to pre-empt the rivaling nonprofit from participating in public good provision are effectively strengthened.[16]

Interestingly, $T_2^*$ is strictly greater than $T_1^*$ by more than the difference in costs $c_2 - c_1$. Assuming henceforth an interior equilibrium in which both the public agency and the nonprofits make some degree of locational compromise, with $\gamma/\tau < t$, we have

$$T_1^* = c_1 - \gamma\tau^2/t < c_2 - \gamma\tau^2/2t = T_2^*.$$

By creating an environment of competitive tendering for the public good project, the

[15] This follows from equation (7) since $x_2^* = 1$ whenever $\gamma\tau \geq t$.

[16] Our finding that under perfect information, the equilbrium transfer payment in fact will fall short of the actual cost of provision suggests that the winning nonprofit will need to rely on other means (such as, volunteering or donations) to close this gap. A related, noteworthy point is that in my model, I implicitly assume that the nonprofit cannot provide the contracted-for service on its own, without the transfer payment. This implies that the other resources, which the nonprofit might be able to draw on to close the financing gap will not be enough for the nonprofit to be able to provide the service on its own. Of course, the lumpiness of the service often rules the feasibility of such a scenario out.

public agency can achieve financial gains on two levels. To see this, note that

$$\begin{aligned} W_g^*(x_1, T_1) - W_g^0(1/2) &= [\lambda c_g - \gamma c_1] + [\gamma\tau(x_2^* - x_1^*)] - t\left[\left(x_1^* - \frac{1}{2}\right)^2 - \left(x_g^0 - \frac{1}{2}\right)^2\right] \\ &= \lambda c_g - \gamma c_1 + \frac{3\gamma^2\tau^2}{4t}, \end{aligned}$$

as such, a purely cost saving motive drives the public agency to contract with the lowest cost nonprofit, nonprofit 1, leading to savings amounting to $\lambda c_g - \gamma c_1$. In addition, so long as both the social desirability and the credibility conditions are satisfied, the public agency underpays nonprofit 1 in the first stage (second term in square brackets). This second source of savings in transfers can be decomposed further into two parts, with

$$\gamma\tau(x_2^* - x_1^*) = \gamma\tau\left(x_2^* - x_g^0\right) + \gamma\tau(x_g^0 - x_1^*).$$

First, $\gamma\tau\left(x_2^* - x_g^0\right)$ reflects a payment on the part of nonprofit 1 to preempt nonprofit 2 from striking a public-private partnership with the public agency. Meanwhile, $\gamma\tau(x_g^0 - x_1^*)$ reflects a payment made by nonprofit 1 to be granted the locational compromise, from $x_g^0$ to $x_1^* < x_g^0$. Of course, the latter deviation from$x_g^0$ to $x_1^*$ comes at a cost to the public agency, in terms of an efficiency loss amounting to $t\left[(x_1^* - 1/2)^2 - (x_g^0 - 1/2)^2\right]$. Henceforth, I shall refer to the net change in the welfare of the public agency (amounting to $3\gamma^3\tau^2/4t$) as the strategic gains from public-private contracting, as it is made possible thanks only to the strategic manipulation of the location of the contracted public good elaborated above. In summary (see figure 2),[17]

**Proposition 1.1** *In a subgame perfect equilibrium with $c_1 < c_2$ and $\gamma\tau/t < 1$, the public agency is better off contracting out public good provision to nonprofit 1, and nonprofit 1 accepts the contract in the first stage if and only if*

$$\lambda c_g - \gamma c_2 \geq -\frac{\gamma^2\tau^2}{4t}.$$

*Though not on the equilibrium path, nonprofit 2 also accepts the contract of the public agency in the second stage, while the public agency provides the public good in stage three midway along the $[0, 1]$ interval. The equilibrium contractual terms stipulate both*

[17]Note that the social desirability condition stated here requires only that $\lambda c_g$ be greater than $\gamma c_2 - \gamma^2\tau^2/4t$ rather than $\gamma c_1 - 3\gamma^2\tau^2/4t$ as $c_1 < c_2$ by definition and $\gamma^2\tau^2/4t$ is of course less than $3\gamma^2\tau^2/4t$. In other words, so long as the threat to contract with nonprofit 2 is credible, the public agency will always be better off contracting with the lower cost nonprofit 1.

*locational and monetary concessions by the two nonprofits:*

$$\{x_1^*, T_1^*\} = \left\{\frac{1}{2} - \frac{\gamma\tau}{2t}, c_1 - \frac{\gamma\tau^2}{t}\right\}, \quad \{x_2^*, T_2^*\} = \left\{\frac{1}{2} + \frac{\gamma\tau}{2t}, c_2 - \frac{\gamma\tau^2}{2t}\right\}.$$

*Equilibrium welfare levels of the three parties are*

$$W_i^* = \theta_i - \frac{\tau}{2} - \frac{\gamma\tau^2}{2t}, \ i=1,2, \quad W_g^* = \theta - \frac{t}{4} + \frac{3\gamma^2\tau^2}{4t} - \gamma c_1.$$

The intuition is as follows. Assuming the unit 'travel cost' to each nonprofit of 'locating' away from his ideal point lies below a certain threshold value ($t/\gamma$), the public agency is able to strategically pit the two rivaling nonprofits against one another. The bigger the mission divergence between the two nonprofits, the larger the public agency's *strategic* financial gains but also the lower the nonprofits' welfare. Evidently, when competing against one another, nonprofits must pay up for their mission conflict: They bear the full cost of the efficiency losses.

## 1.4 Welfare and Pareto Efficiency

The two main themes under scrutiny so far have been: (i) the degrees of locational compromise made respectively by the public agency and the nonprofits and (ii) the size of the financial gains that the public agency can expect to reap from the public-private contract, over and above that which is made possible purely based on the cost advantages that the nonprofits may have. My analysis of competitive tendering so far also assigns all bargaining power to the public agency. In this section, I scrutinize the welfare consequences of such a competitive tendering outcome in comparison to an alternative scenario (e.g. cooperative Nash bargaining with (costly) transfers), in which all parties concerned operate along the Pareto frontier.[18] My objective is to ascertain whether, and if so to what extent, the competitive tendering outcome leads to a deviation from the frontier.

I assume once again that the social desirability condition and the credibility conditions hold. Accordingly, I can set the disagreement point as naturally corresponding to the case of pure public provision of the public good at $x_g^0 = 1/2$. The welfare levels of the three parties at the disagreement point are exactly as they are displayed in equation (4).

[18] One may of course also compare the competitive tendering outcome with other bargaining setups, such as one without transfers to one of the nonprofits, or one involving only nonprofit 1 and the public agency, for example. Our objective in this discussion is mainly to provide a benchmark, in which all three affected parties in this model of public good provision can have equal bargaining power, with otherwise no barriers to trade between the three parties.

Turning now to the Pareto frontier, I first assign the role of the provider of the public good to the lowest cost party, namely, nonprofit 1. The welfare of the three parties with costly transfers are given by:

$$\begin{aligned} W_1(x, T_1 - c_1) &= \theta_1 - \tau x + T_1 - c_1, \quad W_2(x, T_2) = \theta_2 - \tau(1-x) + T_2 \\ W_g(x, T_1 + T_2) &= \theta - \frac{t}{2}\left(x - \frac{1}{2}\right)^2 - \frac{t}{4} - \gamma(T_1 + T_2). \end{aligned}$$

where $\gamma$ once again denotes the transaction costs of transfers.[19] Rearranging terms, I obtain an expression that can be used to determine the Pareto frontier:

$$\begin{aligned} & W_g(x, T_1 + T_2) + \gamma W_1(x, T_1 - c_1) + \gamma W_2(x, T_2). \\ = \ & \theta - \frac{t}{2}\left(x - \frac{1}{2}\right)^2 - \frac{t}{4} + \gamma(\theta_1 + \theta_2 - c_1 - \tau) \end{aligned}$$

At any point along the Pareto frontier, the location $x^p$ which maximizes the right hand side of equation (14) above applies. It can be readily confirmed that such an $x^P$ is in fact uniquely determined at the midway point 1/2. Figure 3 illustrates the Pareto frontier, along which movements are made possible by varying the level of transfers $T_1$ and $T_2$.

Plainly, Nash bargaining between the three parties necessarily yields a location of the public good that is midway along the $[0, 1]$ interval. In addition, no party will be strictly worse off than the disagreement point with pure public provision whenever there exists strictly positive gains from public-private partnership, or, $\lambda c_g > \gamma c_1$. Finally, the maximal attainable welfare levels of each party (when the other two are relegated to their respective welfare levels at the disagreement point) are respectively,[20]

$$W_i^{\max} = \theta_i - \frac{\tau}{2} - c_1 + \frac{\lambda c_g}{\gamma}, i = 1, 2, \quad W_g^{\max} = \theta - \frac{t}{4} - \gamma c_1$$

In sharp contrast, I know from Proposition 1 that when the public agency pits the opposing ideological interests of the two nonprofits against each other in the competitive tendering process,

$$W_i^* = \theta_i - \frac{\tau}{2} - \frac{\gamma\tau^2}{2t} < \theta_i - \frac{\tau}{2} = W_i^0 < W_i^{\max}, i = 1, 2$$

Thus, both nonprofits are always strictly worse off than the disagreement point. Mean-

[19] The transfers $T_i$, $i = 1, 2$ can thus serve to compensate for changes in the location $x$, while $T_1$ take on the additional role of reimbursing the cost of public good provision.

[20] Note that by relegating the location of the public good to the midway point, to be provided by the least cost nonprofit, the maximal welfare gain (over and above the disagreement point) for the public agency is simply the difference in costs $\lambda c_g - \gamma c_1$. Thus, $W_g^{\max} - W_g^0 = \lambda c_g - \gamma c_1$. Meanwhile, since transfer payments to nonprofits entail leakage, $W_i^{\max} - W_i^0 = \lambda c_g/\gamma - c$.

while,

$$W_g^* = \theta - \frac{t}{4} + \frac{3\gamma^2\tau^2}{4t} - \gamma c_1 > W_g^{\max} > \theta - \frac{t}{4} - \lambda c_g = W_g^0,$$

and the public agency does better than all of the attainable outcomes along the Pareto frontier. Perhaps more importantly, since $x_1^* = 1/2 - \gamma\tau/2t < 1/2$,

$$W_g^* + \gamma W_1^* + \gamma W_2^* < W_g\left(x^P, T_1 + T_2\right) + \gamma W_1(x^P, T_1 - c_1) + \gamma W_2(x^P, T_2)$$

by definition of the Pareto efficient location $x^P$. From my discussion in Section 1.2.1, this deviation from the Pareto frontier is perhaps not all that surprising. In particular, the strategic gains of the public agency are achieved by (i) distorting the location of the public goods project away from the midway point in the first stage, and (ii) introducing a credible threat that the location of the public good will be even farther away from the least cost nonprofit's ideal than the midway point in the second stage. It is by so doing that the public agency is able to provide a level of transfers that is strictly less than the nonprofits' own costs $c_1$. In the end, these represent efficiency losses to be borne by the two nonprofits.

## 1.5 Discussion and Extensions

My findings up to this point single out savings in transfers as one reason why public values – in terms of the location of the public good – can be expected to be undermined in a public-private contract. The size of such savings, and accordingly the extent of equilibrium locational compromise depends, among other things, on the substitutability between monetary reimbursements and ideology on the part of nonprofits ($\tau$), and the mode of contract negotiation (e.g. through competitive tendering as in Section 1.3, or cooperative bargaining as in Section 1.4). In particular, the larger $\tau$ is, the more likely it is that nonprofits' ideological mission remain intact under competitive tendering. Meanwhile, the location of the public good is independent of $\tau$ in the presence of Nash bargaining with transfers.

In what follows, I will attempt to get at a deeper understanding of the determination of the size of ideological compromise, and will do so in a number of different settings. The first incorporates the possibility of imperfect enforcement. Specifically, so long as the locational preferences of the nonprofits and the public agency continue to diverge, any public good contract that deviates too much from a nonprofit's own mission runs the risk of contract repudiation. Here, it may in fact make sense for public values to be further undermined and nonprofit ideologies resurrected, precisely because the risks of contract

repudiation ultimately rest on how far the public-private contract requires a nonprofit to go back on her ideals.

Second, my finding that nonprofits do make locational/ideological compromises may well be an artifact of a special case wherein the public good in question is lumpy. In alternative circumstances where the public agency can gainfully contract out multiple public goods to multiple nonprofits, the justification for the public agency to demand ideological compromises by nonprofits may be lessened if not eliminated outright.[21]

Finally, I will show that voluntary locational compromise can take on an informational role as well. This is particularly true in an asymmetric information context, in which the public agency is imperfectly informed about the true cost of public good provision $c_i$ on the part of the nonprofits. Here, the size of a nonprofit's voluntary locational compromise can serve as a useful signal for the public agency.

In what follows, Sections 1.5.1 - 1.5.3 illustrate how my basic model can be readily extended to accommodate each of the aforementioned possibilities: imperfect enforcement, multiple public goods, and asymmetric information.

### 1.5.1 Imperfect Enforcement

With imperfect contract enforcement, the location of the public good stipulated by the public-private contract serves two important purposes. First, it dictates the degree of locational welfare losses ($t(x-1/2)^2$) facing the public agency (equations (6) and (10)) associated with the public good project. Second, it also dictates the degree to which a nonprofit can expect to benefit from reneging, by choosing a location different from that which is stipulated by contract.[22]

I focus on how imperfect enforcement impacts the choice of location and the size of transfers in a public-private contract. I do so by introducing a simple reputational tradeoff that nonprofits face when contracting with the public agency. Consider an infinite horizon extension of the basic model, in which the two nonprofits share a common discount rate $r > 0$. Accordingly, let $t = 0, 1, ..., \infty$ denote time periods, $x(t)$ as the location of the public good at time $t$, and $B_i(t)$ as the net revenue (any transfers net of cost incurred) of nonprofit $i$. The discounted utilities of the nonprofits and the public agency are respectively $\sum_{t=0}^{\infty} W_i(x(t), B(t))/(1+r)^t, i = 1, 2$ and $\sum_{t=0}^{\infty} W_g(x(t), T(t))/(1+r)^t$.

[21] As rightfully pointed out by a referee, President Bush's plan of public services provision through religious organizations does not rule out provision by non-religious organizations.

[22] We consider only locational deviations. Implicitly, whether the public good has been provided is taken to be costlessly observable, but the precise location of the public good is not.

As before, the public agency begins by soliciting the participation of nonprofit 1. If nonprofit 1 deviates from the agreed upon location, detection occurs after a one period lag. The public agency commits to rewards and punishments in the form of a grim strategy: at the start of each time period, a contract is renewed for one more period if no previous violations have been detected. A violation, on the other hand, leads to a permanent discontinuation of the contract starting the very next period.

In keeping with the timing assumptions of the basic model, the public agency turns to solicit participation by nonprofit 2, armed once again with a grim strategy, if either (i) a violation by nonprofit 1 had taken place during the time period prior or (ii) nonprofit 1 refuses the offer. Finally, if either a violation by nonprofit 2 has been observed, or if nonprofit 2 refuses the offer, the public agency shoulders the responsibility of public good provision.

Examples of the projects that I have in mind are the provision of aid services, like citizens' advice and information and agricultural extension programs in developing countries. The sheer distance between the aid-financing body and the actual service delivery agency and opportunity costs of generating evaluation reports can further prohibit the public agency's scrupulous monitoring. The financial contractual arrangements with nonprofit service providers in effect typically comprise staged financing or short funding cycles (Anheier, 2005). The capital infusion over time thereby implies that project execution is periodically revaluated and further finance essentially depends on successful completion of earlier phases. My timing of events, focusing on the issue of delay, thus closely captures the key ingredients of a typical financial relationship between a public procurement agency and a nonprofit service provider.[23]

The mechanics of the solution of the problem is similar to that of the basic model and the proofs of the assertions below are available upon request. I note here the main messages that emerge from imperfect enforcement considerations.

Specifically, let $x_1^I$ and $x_2^I$ be the first and second stage locations contracted by the public agency targeting nonprofits 1 and 2 respectively. As part of the goal of contract design, the locations $x_2^I$ in stage 2 and $x_1^I$ in stage 1 are chosen so that the two nonprofits voluntarily refrain from deviation. For nonprofit 2, the following incentive compatibility condition

[23]Simultaneously, delay in detecting a violation of the contractual terms can also be understood as the consequence of (i) inefficiencies within the judicial system or (ii) the longer-term nature of the project's central objectives. For instance, environmental or HIV/AIDS awareness programs, which seek to institute behavioural changes demand more time before their performance can be effectively measured. These two alternative scenarios are thus also consistent with the form of imperfect enforcement analysed here.

takes the place of equation (5) in the basic model:[24]

$$\begin{aligned}\frac{1+r}{r}W_2(x_2^I, T_2^I - c_2) &\geq W_2(1, T_2^I - c_2) + \frac{1}{r}W_2(x_g^0, 0) \\ &\iff T_2^I \geq c_2 + (1+r)\tau(1-x_2^I) - \tau\left(1-x_g^0\right) \equiv T_2^I\left(x_2^I, x_g^0\right)\end{aligned}$$

Thus, transfers$T_2^I$ and the designated location $x_2^I$ are once again substitutable, although the rate of substitution $\left|\partial T_2^I\left(x_2^I, x_g^0\right)/\partial x_2^I\right| = \tau(1+r)$ is strictly greater than its static analogue $\tau$ in equation (5). In other words, with a one period detection lag, the designation of a public good location that is far from a nonprofits' ideal is costly to sustain, as the required amount of transfers to guarantee incentive compatibility is strictly larger than its static counterpart in equation (5).

With this in mind, maximizing per period welfare of the public agency by choice of $x_2^I$ gives rise to two observations. First, incentive compatibility requires that in stage 2, $x_2^I = 1/2 + \gamma\tau(1+r)/2t$ Thus, $x_2^I > x_2^*$ whenever $r > 0$. In other words, in order to meet the now two-fold objectives of the public-private contract (cost-saving and incentive compatibility), the location of the public good is distorted even further away from the midway point compared to $x_2^*$. Indeed, the larger the discount rate $r$, and potentially more acute the incentives to renege, the larger will be the required deviation from $x_2^*$.

Second, precisely since the alternative location facing nonprofit 1, $x_2^I$, will be even farther away from its ideal compared to when enforcement is perfect, $x_2^*$, the per period reservation utility of nonprofit 1 is reduced. This suggests that nonprofit 1 may voluntarily strike a compromise with the public agency, which entails an even lower level of per period transfer $T_1^I$ compared to $T_1^*$. To this end, note that the incentive compatibility condition applicable to nonprofit 1 is:

$$\begin{aligned}\frac{1+r}{r}W_1(x_1^I, T_1^I - c_1) &\geq W_1(0, T_1^I - c_1) + \frac{1}{r}W_1(x_2^I, 0) \\ &\iff T_1^I \geq c_1 + (1+r)\tau x_1^I - \tau x_2^I \equiv T_1^I\left(x_1^I, x_g^0\right)\end{aligned}$$

Assuming as I did in Section 1.3 that the threat of a public-private contract with nonprofit 2 is credible, it can be readily verified that the public agency's welfare maximizing contract with nonprofit 1 in the presence of imperfect enforcement requires

$$x_1^I = \frac{1}{2} - \frac{\gamma\tau(1+r)}{2t} < x_1^*, \quad T_1^I = -\frac{\gamma\tau^2(1+r)}{2t}(2+r) + \frac{\tau r}{2} + c_1 < -\frac{\gamma\tau^2}{t} + c_1 = T_1^*$$

if and only if $r\gamma\tau/t > 1 - 3\gamma\tau/t$. Thus, the size of the transfer from the public agency to

[24] It can be verified that at an interior optimum, the participation constraint is also satisfied as soon as equation (15) is met.

the least cost nonprofit is in fact smaller than the perfect enforcement benchmark when the discount rate is sufficiently large.

Taken together, granting the winning nonprofit the liberty to adhere more closely to its ideological benchmark, and a corresponding reduction in public to nonprofit transfers, are both indicative of a public agency equipped with a less than perfect ability to enforce the terms of the public-private contract, and when the threat of contract repudiation, as parameterized by the discount rate, is sufficiently large.

### 1.5.2 Multiple Public Goods

Up to this point, I have considered public procurement of indivisible public goods projects, like drilling tube wells or coordinating a regional economic development plan, only. There are, however, many publicly funded service programs that are provided by diverse nonprofits simultaneously.[25]

For simplicity, consider the case of two otherwise identical public goods, located respectively at $x_{g1}$ and $x_{g2}$ as shown in Figure 4. Since citizens' preferences are distance sensitive, citizens located along the segment $[0, (x_{g1}+x_{g2})/2))$ naturally prefer to consume the services provided at $x_{g1}$, while citizens located along the segment $[(x_{g1}+x_{g2})/2), 1]$ prefer $x_{g2}$. On the cost side, if both public goods are to be provided by the public agency, the public agency incurs $2\lambda c_g$ with two public goods to be paid for via taxes on citizens. These observations allow us to sum up the post-tax utilities of all citizens $(\omega_g(x_{g1}, x_{g2}) - 2\lambda c_g)$, now characterized also by the choice that they have individually made between the two public goods located respectively at $x_{g1}$ and $x_{g1}$:

$$\begin{aligned}\omega_g(x_{g1}, x_{g2}) - 2\lambda c_g &= \theta - \frac{t}{8} - \frac{t}{2}\left(x_{g1} - \frac{1}{4}\right)^2 - \frac{t}{2}\left(x_{g1} - \frac{3}{4}\right)^2 \\ &\quad -\frac{t}{4}\left[\left(x_{g2} - \frac{3}{4}\right) - \left(x_{g1} - \frac{1}{4}\right)\right] - 2\lambda c_g.\end{aligned}$$

A number of observations are in order. First, the public agency once again faces a concave problem. By inspection, the two locations that maximize $\omega_g(x_{g1}, x_{g2})$ are uniquely determined at $x_{g1} = 1/4$ amd $x_{g2} = 3/4$, so that the two public goods each serves exactly

[25] Examples of such projects include childcare centres or AIDS hospices, teaching self-employment skills to beneficiaries of antipoverty programs and lending to targeted low-income individuals for their credit needs. In effect, various social policy reforms, such as the Personal Responsibility and Work Opportunity Reconciliation Act of 1996, have explicitly sought to encourage diverse nonprofit providers to cooperate with public welfare programs (Minow, 2002; Anheier, 2005).

half of the population along the linear city. Thus,

$$\begin{aligned} \omega_g(1/4, 3/4) - 2\lambda c_g &= \theta - \frac{t}{8} - 2\lambda c_g \leq \theta - \frac{t}{4} - \lambda c_g = W_g^0 \\ \text{if and only if } \lambda c_g &\geq \frac{t}{8}. \end{aligned}$$

As may be expected, if the cost $\lambda c_g$ is sufficiently large, relative to the transportation costs of the citizens $t$, the public agency optimally supplies a single public good. In what follows, I assume more generally that $c_g$ is large enough so that the public agency never finds it optimal to provide on its own a second public good, regardless of whether the first public good is provided by the public agency, or one of the two nonprofits.[26]

Turning now to public-private partnership, the public agency's decision problem involves the determination of an optimal location pair, $x_{m1}$ and $x_{m2}$, and associated transfers $T_1^m$ and $T_2^m$, as components of two simultaneous public-private contracts.[27]

Like the citizens, the welfare of the nonprofits with two public goods depends on the location of the public good *closest* to her ideal location. Accordingly, a nonprofit can now be strictly indifferent to another nonprofit's location choice, so long as a more proximate public good exists. Even so, I shall demonstrate in what follows that public-private contracting can continue to entail locational compromises made both by the public agency and the two nonprofits.

To see this, note that for a pair of contracts $\{x_1^m, T_1^m\}$ and $\{x_2^m, T_2^m\}$ to be simultaneously acceptable to the two nonprofits, it must be the case that

$$W_1(x_1^m, T_1^m - c_1) \geq W_1(x_2^m, 0) \Longleftrightarrow T_1^m \geq c_1 + \tau(x_1^m - x_2^m) \equiv T_1^m(x_1^m, x_2^m)$$

and

$$W_2(x_2^m, T_2^m - c_2) \geq W_2(x_1^m, 0) \Longleftrightarrow T_2^m \geq c_2 + \tau(x_1^m - x_2^m) \equiv T_2^m(x_2^m, x_1^m)$$

These follow since refusal on the part of either nonprofit to accept the contract will result in only one public good to be provided by the competing nonprofit. Importantly, note that aggregate transfers $T_1^m + T_2^m$ and location, say, $x_2^m$, continue to be substitutes as in equa-

[26] We will return to the role of a sufficiently cost ineffective public agency towards the end of this subsection.

[27] There are a number of other potential possibilities that can be considered even with only two public goods: (i) nonprofit 1 providing both public goods, (ii) nonprofit 2 providing both public goods, (iii) nonprofit $i$ and the public agency each providing one public good, $i = 1, 2$. A complete categorical account of each one of these cases is beyond the scope of this paper. We choose instead to illustrate here the case wherein the two public goods are likely to be the farthest apart (or closest to each nonprofit's ideal location), when each nonprofit is delegated the task of providing one of the two public goods.

tion (5). The rate of substitution differs, however, with $\left|\partial\left(T_1^m\left(x_1^m, x_2^m\right) + T_2^m\left(x_2^m, x_1^m\right)\right)/\partial x_2^m\right| = 2\tau$. Compared to the case of a single public good (equation (5)), demands on the part of the public agency urging nonprofit 2 to make ideological concessions are now costlier. Put differently, it is now more sensible for the public agency to allow nonprofit 2 to maintain her ideological position. The underlying rationale, however, has still to do with the rivalry between the two nonprofits. Specifically, the larger $x_2^m$ is set and thus the farther away nonprofit 1's ideal location is relative to nonprofit 2's designated location, the more monetary concession will nonprofit 1 be willing to make since the alternative is one in which a single public good will be provided by her rival nonprofit 2.

With these participation constraints in place, the public agency maximizes $\omega_g\left(x_1^m, x_2^m\right) - \gamma\left(T_1^m\left(x_1^m, x_2^m\right) + T_2^m\left(x_2^m, x_1^m\right)\right)$ by choice of $\{x_1^m, T_1^m\}$ and $\{x_2^m, T_2^m\}$, subject to the two constraints. As may be anticipated, the condition that guarantees an interior equilibrium with two public goods is now stricter than before, requiring that $\gamma\tau/t < 1/4$ instead of $\gamma\tau/t < 1$, and the optimal interior solution to the public agency's problem is:

$$\begin{aligned} x_1^m &= \frac{1}{4} - \frac{\gamma\tau}{t}, \quad x_2^m = \frac{3}{4} + \frac{\gamma\tau}{t}, \\ T_1^m &= c_1 - \tau\left(\frac{1}{2} + \frac{\gamma\tau^2}{t}\right), \quad T_2^m = c_2 - \tau\left(\frac{1}{2} + 2\frac{\gamma\tau^2}{t}\right) \end{aligned}$$

where the optimal public-private partnership continues to entail ideological compromises made by all parties. In contrast, for $\gamma\tau/t \in [1/4, 1)$, even though $x_1^* > 0$ and $x_2^* < 1$ when there is only one public good to be provided, the intensity of ideological difference between the two nonprofits is strong enough so that the resulting savings in transfers is a sufficient justification for the public agency to demand no ideological compromise from the two nonprofits when there are two public goods, with $x_1^m = 0$ and $x_2^m = 1$. The corresponding transfers to the two nonprofits are accordingly smaller, however, with $T_1^m = c_1 - \tau < c_1 - \tau\left(1/2 + 2\gamma\tau^2/t\right)$ and $T_2^m = c_2 - \tau < c_2 - \tau\left(1/2 + 2\gamma\tau^2/t\right)$.

Before I draw this subsection to a close, I need to confirm that two public goods indeed dominate one, or $W_g^*\left(x_1^m, T_1^m\right) \leq \omega_g\left(x_1^m, x_2^m\right) - \gamma\left(T_1^m + T_2^m\right)$. It can be readily verified that this is equivalent to requiring that nonprofit 2 be a sufficiently cost effective provider of the public good,

$$\gamma c_2 < \frac{t}{8} + \gamma\tau + \frac{5\gamma^2\tau^2}{4t}.$$

Along with my earlier maintained hypothesis (equation (17)) that the cost facing the public agency $c_g$ is sufficiently high, the lesson that can be drawn here is that the degree of observed/equilibrium ideological compromise in fact depends on the cost effectiveness of the public agency relative to nonprofits, $c_g$ and $c_i$, $i = 1, 2$, in an interesting way. In particular, if $c_g$ is high enough, and $c_2$ (and hence $c_1$) is sufficiently low, the provision of

multiple public goods is desirable from the public agency's standpoint only if *both* public goods are provided by nonprofits.[28] In addition, the public agency can maximize her savings in transfers by granting a smaller degree of ideological compromise by the two rival nonprofits.

Taken together, (i) the provision of multiple public goods by multiple nonprofits, (ii) the allowance given to each of them to adhere more closely to their ideological benchmarks, and (iii) a correspondingly lower public to nonprofit transfer, can jointly be symptomatic of cost asymmetry between the public agency and the nonprofits. Specifically, cost asymmetry here simply refers to a situation wherein the public agency is sufficiently cost ineffective in providing the public good and the two nonprofits are equipped with costs $c_i$ that are sufficiently low.

### 1.5.3 Asymmetric Information

As discussed in Section 3, the nonprofit with the least cost is always selected if the public agency is endowed with perfect information with respect to costs $c_i$. Of course, this would also mean that if the cost of public good provision is in fact private information, nonprofit 1 can always overstate her true cost of public good provision, by just enough to continue to secure the right to provide the public good. This can be achieved, for example, by reporting a cost of $c_2 - \varepsilon$, where $\varepsilon$ is a small positive number. The corresponding increase in transfers if the public agency ignores this possibility of cost overstatement, is exactly equal to $c_2 - \varepsilon - c_1$, as implied by Proposition 1.1.

The case of asymmetric information is an interesting extension at this point of my analysis, as it pinpoints how ideological compromises can in fact serve the additional role of a signalling device. Indeed, the cost of project delivery is oft inextricably linked with measures of organizational efficiency or quality of personnel. Importantly, such organizational characteristics are not publicly observable. In what follows, I establish the optimal contractual terms under asymmetric information when $c_i$ is now private information to nonprofit $i$, and unknown both to the public agency, and to the rivaling nonprofit $j \neq i$. Common beliefs about the costs of the each nonprofit are iid, and characterized by a uniform distribution on the $[0, C^+]$ interval.

Since the principal is unable to tailor the requisite transfers to the nonprofit-specific investment costs, and the two nonprofits are otherwise identical ex ante, I consider a

[28] We leave it to the interested reader to work out the case where the public agency is cost effective enough to step in and provide a second public good in place of one of the nonprofits, and to confirm that indeed the equilibrium degree of ideological compromise made by the nonprofits will be strictly larger here.

game of simultaneous competitive tendering over a fixed sized fund, $T$, to be endogenously determined. The question is therefore whether or not the public agency can continue to elicit participation by the nonprofit with the lowest cost.[29] Explicit competition between the two nonprofits is carried out via sealed bids – ideological concessions each nonprofit is prepared to undertake – to determine the winning nonprofit.[30]

I analyze the following sequence of events:

1. The public agency announces the public goods project for which she seeks nonprofit collaboration. The public agency also defines the level of transfers, $T$, to be paid to the partner nonprofit in exchange for his cooperation in the project implementation.
2. The two nonprofits are asked to simultaneously submit individual proposals, to be referred to as bids, $b_i$, which indicate the location of the public good that they are individually willing to provide, or equivalently, the ideological concessions that they are willing to undertake.
3. The public agency selects the most preferred partner nonprofit. Since the two nonprofits are identical ex ante, the same grant/lump-sum transfer of $T$ is offered to both. The proposal that deviates the least from the midway point of the linear city wins.

The utility cost of the bids corresponds to the cost of ideological compromise that each nonprofit is prepared to undertake, with $b_1 = \tau x_1$ and $b_2 = \tau (1 - x_2)$ respectively. A strategy for nonprofit $i$ is a function $b_i (c_i)$ specifying the bid each nonprofit would choose. In a Bayesian Nash Equilibrium, nonprofit 1's strategy $b_1 (c_1)$ is a best response to nonprofit 2's strategy $b_2 (c_2)$, and vice versa.

I simplify the exposition by looking for a symmetric equilibrium in linear strategies:

$$b_i (c_i) < b (c_i) = \alpha - \beta c_i$$

[29] A natural alternative to our auction setup is a menu of contracts $\{x_i (c), T_i(c)\}$, $i = 1, 2$, consisting of a location (decision) function $x_i (c)$ and an associated transfer $T_i(c)$ for the nonprofit at each of the two stages based on reported cost $c$, and solve the mechanism design problem of the public agency. With $c_i \in [0, C^+]$ as the type space, however, it turns out that the single-crossing condition is not satisfied. To see this, simply note that the slopes of the indifference curve for the two nonprofits in $(x, T)$ space are $1/\tau$ and $-1/\tau$ respectively for nonprofits 1 and 2. As such, wrongful reporting of cost types cannot be strictly ruled out, because incentive compatibility for nonprofit $i$ in fact calls for $\theta_1 - \tau x_1 (c) + T_1 (c)$ to be type independent and thus constant for all reported $c$ and $\theta_2 - \tau (1 - x_2 (c)) + T_2 (c)$ to be likewise type independent and constant for all reported $c$ for nonprofit 2. While beyond the scope of this paper, the question of optimal contract design in the context of our model is an interesting question, which we leave for future research.

[30] The nonprofit's strategic decision over the optimal concession is analogous to a special interest group's choice of contributions or endorsements paid to influence political outcomes.

with $\beta > 0$. Equation (19) posits that the size of a nonprofit's bid is inversely related to her costs of providing the public good. Assume in addition that the bids are non-negative and lie in the interval between 0 and $\tau/2$.[31] In other words, $b_i \geq 0$ for all $c \in [0, C^+]$, while at the maximum, the extent of ideological sacrifice that a nonprofit could submit is bounded upwards by the public agency's ideal location at 1/2.

Given the linear strategy of nonprofit 2, nonprofit 1 loses, or equivalently $b_1$ is less than $b_2$ if and only

$$b_1 < \alpha - \beta c_2 \Longleftrightarrow c_2 < \frac{\alpha - b_1}{\beta}$$

Thus, the likelihood that nonprofit 1 loses is given by $Prob(c_2 < (\alpha - b_1)/\beta) = (\alpha - b_1)/(\beta C^+)$. Furthermore, and by definition of the bid $b_2 = \tau(1 - x_2)$ of nonprofit 2, $\tau x_2 = \tau - \alpha + \beta c_2$. Thus, in the event that nonprofit 1 loses and nonprofit 2 provides the public good, nonprofit 1's utility from losing will depend on the size of nonprofit 2's ideological concession: $\theta_1 - \tau x_2 = \theta_1 - \tau + \alpha - \beta c_2$. This distinguishes the nonprofits' problem here from the bidders' problem in standard first price sealed bid auctions. In particular, the utility of losing is *not* simply "going home with nothing", as the location of the public good, or equivalently the size of the winning bid, matters for both the winner and the loser. Taken together, nonprofit 1's expected utility maximization problem can be expressed as[32]

$$\max_{b_1} \int_0^{(\alpha - b_1)/\beta} (\theta_1 - \tau + \alpha - \beta c_2) \frac{dc_2}{C^+} + \int_{(\alpha - b_1)/\beta}^{C^+} (\theta_1 - b_1 + T - c_1) \frac{dc_2}{C^+}$$

$$s.t. 0 < b_1 < \frac{\tau}{2}$$

At this stage, and in the absence of additional information on the size of the transfer, $T$, we have the following result.

The optimal bid nonprofit $i$ submits takes the following form:

$$b_i(c) = b(c) = \max\left\{0, \min\left\{\frac{\tau}{2}, \frac{1}{2}\left(\tau + T - \frac{1}{3}C^+\right) - \frac{c}{3}\right\}\right\}, i = 1, 2$$

[31] We will return to these assumptions in Proposition 3.

[32] To clarify, the first term represents nonprofit 1's subjective probability that nonprofit 2 submits the highest bid, multiplied by his corresponding utility. The second term denotes nonprofit 1's subjective probability that he outbids nonprofit 2, multiplied by his associated utility. The constraint can be understood as a consistency constraint in terms of ideology: nonprofit 1 will never concede to a complete reversal of strategy or ideology. Nonprofit 1's bid $b_1 = \tau x_1$ is proportional to his concession, $x_1$ , but the value of $x_1$ is expected to lie in the interval 0,1/2].

Barring corner solutions, my earlier assumptions that $b_i$ is linear and decreasing in $c$ are indeed borne out, with $\beta = 1/3$. Thus, the size of the location compromise signals the true cost of each competing nonprofits in a Bayesian Nash equilibrium. Meanwhile, the constant $\alpha = \alpha(\tau, C^+, T)$ is made up of the nonprofits' transportation cost $\tau$, the density of the cost distribution $1/C^+$, and the size of the transfer $T$. In particular, a higher $\tau$ renders the alternative of having one's opponent provide the project more costly, and hence strengthens one's urge to win.

Recall also that the likelihood that nonprofit 1 wins given $b_1$, is simply $1-(\alpha - b_1) / (\beta C^+)$. The marginal impact of an increase in nonprofit 1's bid on the winning probability depends critically on the density of the cost distribution $1/C^+$. Naturally, as the density $1/C^+$ rises, this marginal impact strengthens since a rivaling nonprofit is more likely a close cost competitor. The optimal bid in proposition 2 accordingly reflects these observations, and requires that $b_i(c_i)$ monotonically decreases with $C^+$.

Finally, the optimal bid is strictly increasing in the fixed sum, $T$ promised by the public agency. It follows naturally that an increase $T$ shifts the distribution of the winning bid in the sense of first order stochastic dominance: the higher the level of transfers, the closer will the average winning bid be to the center of the linear city. Two points are noteworthy here. First, since each nonprofit is well aware that an increase in $T$ impacts the incentives on the part of both nonprofits to offer ideological compromises, a one-dollar increment in the size of transfers promised to the partner gives rise to an increase in concession of strictly less than equal value ($\partial b_i / \partial T = 1/2$).

Meanwhile, the monotonicity of the winning bid with respect to $T$ once again draws out the dilemma the public agency faces when contracting out public services to nonprofits, as additional savings in transfers can be obtained only by undermining public values. Specifically, the decision problem of the public agency entails the choice of an optimal level of transfers $T$ in order to maximize the expected sum of citizens' welfare, depending in particular on the location of the public good provided by the winning nonprofit.

To this end, note that the extent to which the winning nonprofits' proposal deviate from the midway point of the linear city is

$$y(\widehat{c}, T) = \frac{1}{2} - \frac{1}{\tau} \max\{b(c_1), b(c_2)\} = \frac{1}{2} - \left( \frac{\alpha(\tau, C^+, T) - \beta \widehat{c}}{\tau} \right)$$

since $1/2 - b_1/\tau = 1/2 - x_1 \geq 0$ and $1/2 - b_2/\tau = x_2 - 1/2 \geq 0$. $\widehat{c}$ denotes the random variable $min\{c_1, c_2\}$. From equation (6), the expected sum of the citizens' welfare, given

the locational deviation (from 1/2) of the winning bid, net of the cost of transfers $\gamma T$, is

$$EW_g = \int_0^{C^+} (\theta - \frac{t}{4} ty(\widehat{c}) - \gamma T) dF(\widehat{c})$$

where $E$ is the expectation operator and $F(\widehat{c}) = 1-(1-(\widehat{c}/C^+))^2$ denotes the probability distribution function of the cost of the winning nonprofit $\widehat{c} = min\{c_1, c_2\}$. Maximizing $EW_g$, subject to the definition of $y(\widehat{c})$ in equation (27) gives[33]

**Proposition 1.2** *In a public-private partnership that maximizes the expected welfare of the public agency, $b(c) < \tau/2$ if and only if $C^+/9 \leq \gamma\tau^2/t$, while $b(c) > 0$ if in addition $\gamma\tau \leq 1/6$, for all $c \in [0, C^+]$.*

*At an interior optimum, with $0 < b(c) < \tau/2$ for all $c \in [0, C^+]$, the size of the optimal transfers $T^A$ is*

$$T^A = E\widehat{c} + 2\left(\frac{C^+}{9} - \frac{\gamma\tau^2}{t}\right) < E\widehat{c}.$$

The expected deviation from the midway point of the linear city in this public-private partnership, $Ey(\widehat{c}, T^A)$, and the corresponding expected bid of the winning nonprofit, $Eb(\widehat{c})$ are

$$\begin{aligned} Ey(\widehat{c}, T^A) &= E\left(\frac{1}{2} - \frac{\alpha(\tau, C^+, T^A) - \beta\widehat{c}}{\tau}\right) = \frac{\gamma\tau}{t} > \frac{1}{2} - x_1^*, \\ Eb(\widehat{c})/\tau &= \frac{1}{2} - \frac{\gamma\tau}{t} < x_1^* \end{aligned}$$

The first part of Proposition 1.2 pins down the conditions under which an interior solution can be found. In particular, it requires that the intensity of nonprofits' commitment as measured by $\tau$ be not too low, for otherwise the optimal bid be settled at its upper bound at $\tau/2$. Meanwhile, $\tau$ should not be too large either, for otherwise with $\gamma\tau/t > 1/6$, the public agency's optimal contract will demand no locational compromise and opt instead to lower transfers, much as was already discussed in Section 3 when information asymmetry was not an issue.

Recall also that under perfect information, nonprofits are underpaid, as transfer payment in a public-private partnership falls short of the nonprofits' costs. A key message of

[33]The details of the proof of Proposition 3 are relegated to Appendix B.

Proposition 1.2 is that an analogous observation holds in the asymmetric information case, and transfer payment $T^A$ is strictly less than the expected cost of the winning nonprofit.

Note that $T^A$ is unambiguously lower when the competing nonprofits pursue strong, divergent missions (an increase in $\tau$). In addition, Proposition 1.2 highlights the density of the cost distribution as an additional determinant: a unit reduction in $C^+$ leads to a reduction in $T^A$ that exceeds the corresponding change in the expected cost of the winning nonprofit ($\partial T^A/\partial C^+ > \partial E\widehat{c}/\partial C^+$). Intuitively, as the degree of cost competition between the two nonprofits rises, the need for the public agency to use transfers as a means to compensate for the nonprofits' ideological compromise falls. Finally, substituting the optimal contractual terms into the objective functions of the public agency and the nonprofits, assuming once again an interior solution, we have

**Proposition 1.3** *The expected welfare of the public agency under a public-private partnership is higher than under pure public provision of the public good if and only if*

$$\lambda c_g - \gamma E\widehat{c} \geq -\frac{(\gamma\tau)^2}{t} + \frac{t}{2}\left(\frac{C^+}{9\tau}\right)^2 + \frac{2\gamma C^+}{9}.$$

The expected welfare of the winning nonprofit is strictly less under public-private partnership,

relative to pure public provision if and only if

$$\frac{C^+}{9} < \frac{\gamma\tau^2}{2t}.$$

Our final proposition is concerned with the welfare level of the three parties in the auction set-up, compared to pure public provision. To this end, each of the following serves to motivate the public agency to form a public-private partnership under asymmetric information: a high cost of provision $\lambda c_g$ on the part of the public agency, a low unit transportation costs on the part of citizens $t$, together with a dense cost distribution on the part of nonprofits, $(1/C^+)$. Comparing this result with Proposition 1.1, where $\lambda c_g > \gamma c_1$ is sufficient for a public-private partnership to strictly benefit the public agency, we find that asymmetric information indeed impedes public-private partnership. In particular, even when $\lambda c_g$ exceeds the expected cost of the winning nonprofit, accounting for any required additional transaction costs, $\gamma E\widehat{c}$, the public agency may still refrain from closing a partnership agreement with nonprofits when the expected locational deviation $Ety(\widehat{c})^2$ is higher than the savings in transfers $T^A$.

It may also be of interest to note that while severe competitive tendering triggered by a dense cost distribution is desirable from the public agency's point of view, the same factor spells potential welfare losses for the two nonprofits. In concert with Proposition 1, the average winning nonprofit can indeed be worse off in the process of competitive tendering, compared to the pure public provision scenario, particularly when the cost distribution is dense enough, or when both nonprofits share strong adherence to their respective ideological missions.

In summary, I have extended the model to incorporate private information where competitive tendering takes the form of a sealed bid auction. Consistent with my previous discussions, the transportation costs $\tau$ and $t$, the cost of provision $\lambda c_g$ and $\gamma c_i$, impact equilibrium contract terms and welfare in a predictable fashion. More importantly, this extension unveils an additional determinant – whether the two nonprofits are close cost competitors $(1/C^+)$ – as another important determinant of the ideological compromise that each nonprofit willingly undertakes, as well as the size of equilibrium transfers between the public agency and the winning nonprofit.

## 1.6 Conclusion

I have provided a tractable model of competitive bidding for a single, lumpy public service contract with two ideologically distinct nonprofits. I have shown that government can exploit the ideological divide between to competing nonprofits to maximise her gains from partnering with a nonprofit. The contract for the less cost efficient nonprofit thus serves as a credible threat against the more cost efficient counterpart. The cost involved in achieving these savings in financial commitments, as it turns out, shows up in the form of a public compromise in the dedicated location of the public good. Next, I have revealed that the problem of imperfect enforcement imposes extra pressure on government to undermine public values, precisely because the risk of contract repudiation ultimately rests on how far the public-private service contract requires a nonprofit to back on her ideals. Finally, I have established that when there is asymmetric information about the nonprofits' true cost of service provision, a nonprofit's bid signals this true cost, but more than that, it also reflects the level of *ex ante* fixed government transfer, the degree to which the competing nonprofits' mission differ, and the extent to which the rivaling nonprofits are close cost competitors. At one extreme, the public agency can effectively engage close cost competitors with strong, divergent missions in a competitive tendering process, committing as little as zero government transfers. Of course, under such a scenario, the public agency has also committed to fully relying on market competitive forces between the two ideologically distinct nonprofits to determine the size of the public compromise

at stake. Finally, when we allow for the possibility of contracting a divisible project to multiple nonprofits, then the justification to demand ideological compromises from the nonprofits may in fact be lessened if not eliminated outright.

My analysis can explain why it might be efficient for government to undermine public sector values when contracting with nonprofits. That is, the analysis provides an efficiency rationale for a government who restricts transfer payments to the nonprofit contractor at the expense of public value compromise. Furthermore, it can explain why "government contracts with nonprofits often include as a standard feature pricing below cost (Miller, 2006)." I have also suggested that certain institutional factors like improved contract enforcement and improved government information about nonprofits' true cost of service delivery have desirable features because they act to limit the size of public value compromise.

Finally, my analysis also raises the nature of bargaining between nonprofits and donors as an important issue that deserves further understanding. For example, instead of the role of a *principal* played by the public agency (donor) in the bulk of our analysis, a cooperative bargaining agreement between the parties (public and nonprofits) concerned, as shown in Section 1.4, can have real efficiency, in addition to distributional consequences. Precisely how these would play out in a setting with asymmetric information, for example, are interesting questions though beyond the scope of this chapter.

## Appendix A

I check that it makes sense for the public agency to contract with the least cost nonprofit. One way of doing so involves the deliberate violation of the participation constraint for nonprofit 1 in the first stage by offering a level of transfers that is less than $c_1 + \tau(x_1^* - x_2^*)$. The public agency's welfare in this case ($W_g^{-1}$) relative to $W_g^*$ is:

$$W_g^{-1} - W_g^* = \gamma\,(c_1 - c_2) - \frac{\gamma^2\tau^2}{2t} < 0$$

Clearly, by selecting the higher cost nonprofit, the public agency is worse off on the grounds of cost-inefficiency $c_1 - c_2 < 0$. The second term arises due directly to equation (12), wherein $T_1^* - T_2^*$ $(< c_1 - c_2) < 0$ represents the public agency's savings in transfer upon adding one more nonprofit into the competitive tendering process.

A second option involves switching the order in which nonprofits 1 and 2 enter into the extensive form game. The rest of the game remains the same as before. A similar backward induction exercise, guaranteeing participation by both nonprofits, and social desirability

of the public good project with public-private partnership ($\lambda c_g - \gamma c_2 \geq -\gamma^2\tau^2/4t$), yields contract terms $\{x_1^{**}, T_1^{**}\} = \{1/2 - \gamma\tau/2t, c_1 - \gamma\tau^2/2t\}$ and $\{x_2^{**}, T_2^{**}\} = \{1/2 + \gamma\tau/2t, c_2 - \gamma\tau^2/t\}$. Also let the equilibrium welfare levels of the three parties be denoted by a double asterisk, we have

$$W_i^{**} - W_i^{*} = 0, \quad i = 1, 2 \qquad W_g^{**} - W_g^{*} = \gamma\left(c_1 - c_2\right) < 0$$

Sequencing the entry of the two nonprofits in the reverse order thus still allows the public agency to reap strategic financial gains, but nevertheless loses sight of the cost savings that are specific to contracting with nonprofit 1.

## Appendix B

**Proof of Proposition 3:** The expected welfare of the government, $EW_g$.

$$EW_g = \int_0^{C^+} \theta - ty(\widehat{c}) - \frac{t}{4} - \gamma T) dF(\widehat{c})$$

It can be readily confirmed that $EW_g$ is strictly concave in $T$ and twice continuously differentiable. The (unique) optimal government transfers can be had by maximizing $EW_g$ with respect to $T$, which yields

$$T^A = \beta C^+ + 2\left(\frac{C^+}{9} - \frac{\gamma\tau^2}{t}\right)$$

as the optimal level of transfers. The expression in Proposition 3 can be had by observing that $\beta C^+ = E\widehat{c}$. Substituting $T^A$ into the definition of the bid functions $b(c) = \alpha - \beta c$, we have, $b(c) < \tau/2$ if and only if $C^+/9 \leq \gamma\tau^2/t$ for any $c \in [0, C^+]$. In addition, $b(c) > 0$ if $(\gamma\tau)/t + 2C^+/(9\tau) \leq 1/2$, for all $c \in [0, C^+]$. Thus, if $C^+/9 \leq \gamma\tau^2/t$ is already satisfied, $(\gamma\tau)/t + 2C^+/(9\tau) \leq 1/2$ if $(\gamma\tau)/t < 1/6$ as displayed in Proposition 3.

Also, since $y(\widehat{c}, T^A) = 1/2 - b(\widehat{c})/\tau$,

$$y(\widehat{c}, T^A) = \frac{1}{2} - \frac{1}{\tau}\left(\alpha\left(\tau, C^+, T^A\right) - \beta\widehat{c}\right) \Longleftrightarrow Ey\left(\widehat{c}, T^A\right) = \frac{1}{2} - \frac{1}{\tau}\left(\alpha\left(\tau, C^+, T^A\right) - \beta E\widehat{c}\right)$$

Likewise,

$$Eb(\widehat{c}) = \alpha\left(\tau, C^+, T^A\right) - \beta E\widehat{c}$$

Substituting $T^A$ and $E\widehat{c} = \beta C^+$ into the above equations, we obtain the result displayed in Proposition 3.

**Proof of Proposition 4:** Recall that under pure public provision with perfect information, the public agency's welfare is $W_g^0 = \theta - t/4 - \lambda c_g$. Meanwhile, the maximal expected welfare of the public agency with asymmetric information, assuming once again that an interior solution applies, is equal to $EW_g = \theta - t/4 - tEy\left(\widehat{c}, T^A\right) - \gamma T^A$. In particular,

$$Ey\left(\widehat{c}, T^A\right)^2 = \int_0^{C^+} \left(\frac{t}{2} - \alpha\left(\tau, C^+, T^A\right) - \beta\widehat{c}\right)^2 dF(\widehat{c}) = \left(\frac{\gamma\tau}{t}\right)^2 + \frac{1}{2}\left(\frac{\beta^2 C^+}{\tau}\right)^2$$

Evaluation the difference $EW_g - W_g^0$ upon substituting the expressions for $Ey\left(\widehat{c}, T^A\right)^2$ and $T^A$ yields the expression displayed in Proposition 4.

The ex post welfare of the winning nonprofit under asymmetric information is given by:

$$W_i\left(\widehat{c}, T^A\right) = \theta_i - b_i + T^A - \widehat{c} = \theta_i - \frac{\tau}{2} + \frac{\beta C^+}{2} - 2\widehat{c} + T^A.$$

Taking expectations and substituting for $T^A$,

$$EW_i\left(\widehat{c}, T^A\right) = \theta_i - \frac{\tau}{2} - \frac{\gamma\tau^2}{t} + \frac{2C^+}{9}.$$

The last result in Proposition 4 follows upon recalling that the welfare of the same nonprofit if the government provides the public good herself is: $\theta_i - \tau/2$.

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# Chapter 2

# Contracting for Aid: Does Organizational Form Matter?

## 2.1 Introduction

We often think of international aid as a function directly performed by government; however, a great deal of aid is actually contracted out by government to private nonprofit and for-profit enterprises (see e.g. Dickinson, 2005; Berrios, 2000; Taupiac, 2001, Werker and Ahmed, 2007). Major aid agencies, like the UK's Department for International Development (DFID) and the US Agency for International Development (USAID), spend at least one third of their budgets on aid procurement. They typically allocate these aid contracts using *competitive scoring auctions*, open to nonprofit and for-profit firms alike. This presents an ideal setting to examine empirically whether bidding and contracting behaviour systematically differ across nonprofit and for-profit firms. In other words, does organizational form –by organizational form, I mean whether the tenderer is a nonprofit or a for-profit– matter for the nature of contracts? This is an interesting, unexplored topic, with potentially far-reaching consequences for the architecture and quality of aid service delivery and, more broadly, public sector organization.

The critical characteristic of a nonprofit firm is that it is barred from distributing any profits it earns to those who have invested in it or manage it (see e.g. Hansmann, 1996). Since distribution of value (profit) is central to the incentives that allow a for-profit business to function, an organizational form that lacks these incentives must rely on another motivational mechanism. For nonprofits this is mission. First and foremost, nonprofits are dedicated to creating social value –be it spiritual, moral, societal, aesthetic, intellec-

tual or environmental (see e.g. Phills, 2005; Brown and Slivinski, 2006; Frumkin, 2002; Frumkin and Andre-Clark, 2000; Anheier, 2005). This logic gives rise to a nonprofit's distinct culture and routines. Therefore, the distinct *identity* of nonprofits and for-profits could have important implications for the way these organizations behave in an open, mixed competitive contracting environment with government, particulary given the inherent incompleteness of aid service contracts. Intuitively, organizational form might affect not only the choice of aid service activities to bid for and the nature of competitive advantage, but also behaviours *ex post* like the propensity to cut quality in the process of cutting costs, to take control over project design[1] or to take advantage of any renegotiation opportunity to hold-up government. This paper is the first to examine evidence of the role that organizational form plays in shaping contracting outcomes with government.

The Chapter first presents a simple model of competitive bidding for aid contracts with two types of contestants –for-profit firms who simply maximize profits and nonprofit firms who essentially only care about the project's outcomes and the way this is achieved, provided they break even.[2] I consider a situation where aid contracts are incomplete. Intuitively, they can be incomplete because of non-contractible aid service quality, non-contractible project design, and/or simply because the "Terms of Reference" –i.e., the scope of the work, tasks, expected outputs and deliverables– are imprecise or ill-defined.[3] The basic idea is that these three dimensions of contractual incompleteness play a prominent role in determining a nonprofit's and for-profit's competitive strategy, and hence contracting behaviour. I show that if the agent is a for-profit, then she will only value aid service quality to the extent that this affects the size of her anticipated renegotiation surplus. Further, in the event of a contract renegotiation opportunity, she will simply demand the largest transfer, which makes government still willing to continue with the

[1] It is often feared that increased government contracting of services to nonprofits can jeopardize public purposes and public commitments to say equality, freedom, fairness and democracy (see e.g. Minow, 2002 and 2003). For example, a religious nonprofit might seek to imbue the aid service delivery process with its religious values. To the extent that a nonprofit promoting these values goes against the grain of government's ideal plan of execution, this creates an obvious loss to government.

[2] This characterization captures the widely held view that a development nonprofit is largely staffed by altruistic employees and volunteers working towards ideological, rather than financial, ends. Their founders are often intense, creative individuals who sometimes come up with a new product to deliver or a better way to deliver existing goods and services (Werker and Ahmad, 2007). Typically, people with very strong views about development, its importance and how it should be done, will prefer to work for a nonprofit precisely because the organization overall is similarly (and credibly) committed to these views. There is no risk for compromise at the expense of quality or vision to further say shareholder value. This characterization also reflects the widely felt fear that increased government contracting of aid services to nonprofits can jeopardize public purposes and public commitments to equality, freedom, fairness and democracy.

[3] In other words, the assumption of contractual incompleteness is not hard to motivate once it is recognized that the (i) quality of service and (ii) style of service delivery government wants often cannot be fully specified, and the (iii) contracted-for services can be described with various degrees of precision. To understand the trade-offs government faces when contracting with nonprofits and for-profits, we need to consider each organization type's incentives where contracts are incomplete.

project. And, since she lacks a genuine concern for the project outcomes,[4] she will always copy or apply the preferred project design of government. In contrast, if the agent is a nonprofit, she will have a relatively stronger incentive to improve aid service quality compared to a for-profit, but also strive to promote her own ideal project design (which is not necessarily the same as the government's ideal design) -if not right from the start of the project delivery process, as soon as the opportunity to renegotatiate the contract arises.[5]

The Chapter then tests this theory using a unique panel data set that I gathered on all 1,222 bids submitted for a total of 457 contracts competitively let by the UK's Department for International Development, widely regarded as a leading aid agency. Nearly 75% of these bids hailed from for-profits ranging from large consultancy firms like KPMG to very small business enterprises. Furthermore, for-profits represent 60% of the 225 distinct firms who also won at least one contract. The data set is essentially the universe of competitively procured contracts issued by DFID between 1999 and 2003 that had also been completed by August 2004. The data includes bidder identities, proposed cost estimates and project duration, bid's scores on a series of both price and quality related dimensions, and the weights ex ante assigned by DFID to each individual evaluation criterion. The data also contains detailed information on the initially agreed contract, and the entire profile of contractual amendments. Finally, it includes the ratings by two independent judges of each project's description (also called the "Terms of Reference") on half a dozen dimensions, ranging from precision with which the tasks are specified to the public goods nature of the project to the relative significance of labour inputs to the project's realization. This data set is the first to provide systematic, empirical evidence of how nonprofits and for-profits actually behave in a competitive marketplace for aid contracts.[6] Furthermore, the data is remarkably detailed compared to what is normally available in studies of procurement (see e.g. Bajari, Houghton and Tadelis, 2006; Levin and Tadelis, 2005; Marion, 2005; Crocker and Reynolds, 1993; Chakraverty and MacLeod,

[4]In the model, I assume that a for-profit does not directly value the project outcomes as such. This is nothing but a simplifying assumption. All that is needed for the theory's results to hold is that a for-profit cares less about the project's outcomes than a nonprofit.

[5]To illustrate, consider a post-doc candidate who is often prepared to earn a lower salary in exchange for greater freedom to research what he or she wants. This argument is distinct from the fact that, in this example, academic institutions incur lower labour costs, because they rely say on voluntary labour. I thank Marcel Fafchamps for pointing this out.

[6]Previous work on contracting for aid includes Andersson and Auer (2005), who examine private contractors' incentives in the competitive bidding process, and present some empirical evidence based on 21 qualititative interviews with consultants working at the 10 Swedish consulting firms with the largest Sida contracts in 1999. They find, consistent with the way I've modeled a for-profit's preferences, that "consultants are often more preoccupied with what they perceive are Sida's concerns than with what they perceive are the recipients' needs." Berrios (2000) investigates how USAID awards aid contracts, and illustrates his arguments for why the process is flawed with selective, empirical evidence. Dickinson (2005) approaches the topic of "privatized foreign aid" from an international law perspective, and proposes a set of accountability mechanisms that could help retain crucial public values in the private aid service delivery.

2004).

The model yields three key empirical predictions. First, we expect to find nonprofits compete for aid projects where (i) there exist high returns to non-contractible quality innovations (e.g. projects with a strong public goods component), and (ii) government finds strict adherence to the initial "Terms of Reference" relatively less important (e.g. projects where government holds weak views about how the project should be provided or disagreement with government about project design is minor), and (iii) nonprofits reap substantial intrinsic gains from project realization (e.g. projects where labour input is the main input in the service delivery process). Second, the initial offers made by nonprofits will, on average, adhere less to the project's "Terms of Reference" than the initial bids submitted by for-profits. Intuitively, when nonprofits are able to achieve a strong cost and/or differentiation advantage, they will exploit such a competitive advantage to impose their preferred design right from the start of project implementation. Finally, the government's *ex post* transaction costs when contracting with a for-profit will be substantially higher than when contracting with a nonprofit. The intuition here is that because nonprofits first and foremost intrinsically value the project outcomes, they will use any contractual renegotiation opportunity simply to seize control over project design, and not to capture the whole renegotiation surplus. The data is consistent with all three predictions.

Aid procurement is a vast and thriving business. Preliminary figures for 2005 show a record rise in overseas development worldwide of 31.4 per cent to a total of $106.5 billion, a historic high. Private sector involvement in the aid industry will most certainly continue to rise. Understanding and quantifying the risks from contracting out aid services provision to private suppliers is therefore of immediate interest to today's policy debate on aid. In the concluding section, I suggest several policy changes that could help redress some of the weaknesses in the standard design of aid procurement auctions and contracts that my analysis has revealed.

This Chapter makes a contribution to the economic literature on organization and strategy (see e.g. Roberts, 2004; Besanko et al., 2004; Williamson, 1975; Gibbons, 2001). It advances one simple, yet intuitively appealing, representation of nonprofit and for-profit preferences, and investigates the implications of the competitive interactions between these two organizational types for contractual arrangements with government. Most aid contracts leave the buyer to substantial ex post risks, and diverge in terms of how closely the actual agreed and implemented contract rhymes with the buyer's original project specifications. The Chapter provides an explanation for this variety in initial contracts and ex post renegotiation costs, linking them to heterogeneity in agents' organzational form and contractual incompleteness. More importantly, given this variety, the model

generates novel testable predictions about the cross section of contracts and contractual amendments.

The Chapter also contributes to a growing literature on incentives and public sector organization (see e.g. Besley and Ghatak, 2001; Hart, Shleifer and Vishny, 1997; Huysentruyt and Chau, 2006) that tries to identify the impacts of alternative institutional designs (like, public-private partnerships) on public goods provision. The novelty here is that I use the lens of contract to examine nonprofit and for-profit organization and their respective role (value added) in public sector procurement. Also, comparing the bids of nonprofits and for-profits for a single contract enables me to estimate more directly the influence of organizational form on firm behaviour compared to previous empirical work on mixed industries (see e.g. Ballou and Weisbrod, 2003; Malani and Choi, 2004; Bertrand, Hallcock and Arnould, 2005).

The rest of this Chapter is organized as follows. The next section presents a simple formal model of aid contract competition that identifies how organizational form affects the nature and risks of contractual arrangements with official donor agencies. Section 3 describes the contracts and the data used in the empirical analysis. Section 4 presents the empirical findings. Section 5 concludes.

## 2.2 A Model of Contracting for Aid

The model illustrates how an organization's nonprofit status may affect its optimal bidding and contracting 'policy'. Consider a setting in which a single agency wishes to contract-out the delivery of a discrete public project. To select the public service provider, the buyer holds an auction with contenders of two possible observable types, denoted by $\sigma \in \{n, f\}$, where $n$ stands for nonprofit and $f$ for for-profit. The agents differ solely in terms of their payoffs. For-profits simply maximize profit. That is to say, they behave so as to maximize the difference between the transfers they receive and the costs they incur. Nonprofits, by contrast, maximize non-pecuniary project benefits subject to at least breaking even. In other words, like the buyer, nonprofits intrinsically value the project outcomes; they care about project design and service quality.

Project design affects one's valuation of a project if completed, yet is non-contractible. Let $\delta \in \{g, n\}$ denote two possible project designs – each associated with the preferred design of the buyer (i.e., government) and the nonprofit. For instance, in the case of an HIV/AIDS prevention training programme, the buyer and nonprofit might differ considerably in their

preferred strategy, i.e., disagree over how best to provide the service.[7] Let $\theta_{g\delta}$ be the buyer's valuation if the project design is $\delta$ with:

$$\theta_{gn} = \theta_{gg} - \mu_g.$$

Thus, $\mu_g$ is the loss to the buyer from having the "wrong" project design. Similarly, let $\theta_{n\delta}$ be the nonprofit's valuation if the project design is $\delta$ with

$$\theta_{ng} = \theta_{nn} - \mu_n.$$

The parameter $\mu_n$ captures the loss to the nonprofit from failing to imbue the project's outcome with her preferred design. Intuitively, the greater the preference incongruence between the contracting agents, the higher the disutilities $\mu_g$ and $\mu_n$. Also, the more intense each agent's preference for a specific approach, the higher the losses $\mu_g$ and $\mu_n$. Conversely, the more equivalent the available approaches or the less certainty there is about which approach the contractor should implement, arguably the smaller $\mu_g$.

The payoff from the project also depends on costly and non-contractible effort committed by the agent, denoted by $e \geq 0$. Effort adds value to the project denoted by $b(e)$, where $b(.)$ is smooth, increasing and concave.

Henceforth, I represent the cost of delivering the public service to a for-profit and a nonprofit as, respectively, $c_f$ and $c_n$.

Suppose that the project involves a transfer of $T$ from the buyer to the agent. Then, the buyer's payoff is:

$$V^g(T, e, \delta) = \theta_{g\delta} + b(e) - T.$$

The payoff to a for-profit contractor is simply:

$$V^f(T, e, \delta) = T - c_f - e,$$

and to a nonprofit contractor is:

$$V^n(T, e, \delta) = \theta_{n\delta} + b(e) + T - c_n - e.$$

Again, the buyer and nonprofit directly value the project's outcome, which varies with the choice of $\delta$ and $e$. On the other hand, the for-profit derives no intrinsic utility from the project's realization, instead only values the net profit.[8]

[7] Put differently, $\delta$ captures to the qualitative aspects of project design that are too costly or simply impossible to specify in a contract so that they can be monitored and verified by a third party.

[8] Like in Chapter 1, I assume that a nonprofit explicitly values the project's outcomes. But now, in

### 2.2.1 The First-Best

Suppose as a benchmark that $(e, \delta, T)$ can be specified by the government. Then, we have the following result:[9]

**Proposition 2.1** *In the first-best, if* $c_n \leq c_f + \theta_{n\delta} + b(e^*)$, *then*

$$\begin{aligned} 2b'(e^*) &= 1, \\ \delta^* &= \begin{cases} g & \text{if } \mu_g \geq \mu_n \\ n & \text{if } \mu_g < \mu_n \end{cases}, \end{aligned}$$

*and government strictly prefers contracting with a nonprofit. If* $c_n > c_f + \theta_{n\delta} + b(e^*)$, *then*

$$\begin{aligned} b'(e^*) &= 1, \\ \delta^* &= g, \end{aligned}$$

*and government strictly prefers contracting with a for-profit.*

Proposition 2.1 reveals three important insights. First, in the absence of any contracting problems, government and the contractor will simply choose $e$ to maximize the total net surplus from their trading/contracting relationship, and divide the surplus between them using lump-sum transfers. The optimal $e$ is thus determined based on considerations about the private marginal benefits $b'(e)$ to the two contracting parties. At the social optimum, the marginal social benefit of spending extra effort to improve output quality must equal the marginal cost of that effort, which equals one. The proposition shows that even in a "first best world," contracting with a for-profit would involve a lower level of service quality than contracting with a nonprofit. One interpretation of this result is that even when $e$ is observable and verifiable, it is simply too costly for government to require a for-profit contractor to invest more effort than the level that equates $b'(e^*)$ to 1. The proposition thus provides an efficiency rationale for a government who "compromises" $e$ when contracting with a for-profit.

Second, in a "first best world," a nonprofit would have a competitive advantage vis-à-vis a for-profit. The competitive advantage derives from the fact that a nonprofit, in contrast to a for-profit, intrinsically values project outcomes. Evidently, even if the nonprofit was

contrast to the modelling assumptions in Chapter 1, I assume that a nonprofit does not reap project benefits unless it is itself implementing the project, that is, project contractor.

[9]It is worthwhile pointing out here that I am limiting the space of possible contracts to joint surplus maximizing contracts only, simply for purposes of clarity and practicality. Strictly speaking, focussing on this subset of contractual arrangements is already a deviation away from the first best.

less cost efficient (i.e., $c_n < c_f$), she may still be awarded the contract provided the returns to effort and her valuation of the project were sufficiently high.

Finally, the "first best" project design would not always coincide with government's ideal. It would be the design preferred by the party who experiences the greatest loss from the "wrong design." When government were to contract with a for-profit, government would also dictate $\delta$. When government were to contract with a nonprofit, ownership over project design would go to the party whose disutility from losing control over project design is the greatest -from government's point of view, a pragmatic compromise.[10]

### 2.2.2 Second-Best Contracting

For the remainder of the analysis, I study a second-best contracting game with the following timing and features:

1. First, government and contractor agree on the lump-sum transfer $T$ and up-front project design $\delta$.
2. Second, effort $e$ is chosen and is assumed to be non-contractible.
3. Third, after effort $e$ is sunk, nature determines whether the contract can be renegotiated. Specifically, there is an exogenously given precision $\tau \in [0,1]$ denoting the probability that the project can be renegotiated. In other words, with probability $\tau$ the parties will be confronted with the need to adapt to unanticipated disturbances that arise by reason of gaps, errors and/or omissions in the original contract. In the event of renegotiation, I assume that all of the bargaining power resides with the contractort: she makes a take-it-or-leave-it renegotiation offer $(t, \Delta)$ to the government, where $t$ is a payment from the government to the contractor if the project is to continue and $\Delta$ is the continuation project design.

The contractor can thus seize on the renegotiation opportunity to demand a higher price and/or change the project design. Let us now proceed to characterize the nature of the

[10]Thus, even when there are no limits on contracting between the two parties, we expect the party with the highest $\mu$ to determine the project's design. Thus, the buyer will only press ahead with his own preferred project design if doing so helps him achieve the joint surplus maximizing outcome. This insight is reminiscent of Besley and Ghatak's main proposition (2001), where they state that in a "public-private partnership", ownership of the public good should reside with the party who cares most about the project. Here, ownership of the project's design should similarly reside with the party who values control over project design the most, i.e., who experiences the greatest loss from relinquishing control over project design.

contractual relationship, including the form of contract with a nonprofit versus a for-profit, reasoning by backward induction.

I begin with the renegotiation game. I will show that the outcome of this depends on whether the contractor is a for-profit or a nonprofit. Consider first the case of a for-profit. Under the assumptions of the model, she will demand the largest transfer, which makes the funder still willing to continue with the project. This is

$$t_f = \theta_{g\Delta} + b(e_f).$$

It is clear from this that renegotiation will always result in the project design preferred by government, i.e. in $\Delta_f = g$.

In the case of a nonprofit, the agent cares only about breaking even. Opportunism takes the form of changing the project design. To make life simple, suppose that $\theta_{gg} - \mu_g > -K$, where $K > 0$ denotes the buyer's anticipated costs of prematurely terminating the contract and having to procure the remainder of the project to someone else. This assumption simply says that governmnet always wishes to proceed with the project when the nonprofit picks $\delta_n = n$. In this case, we have $t_n = 0$ and $\Delta_n = n$ as the outcome of the renegotiation game.

**Proposition 2.2** *The renegotiation offer made by a nonprofit contractor will ceteris paribus be cheaper than the offer made by a for-profit, but will involve a change in project design away from government's ideal project design.*

Proposition 2.2 reveals that effectively there are always undesirable outcomes that arise when renegotiations occur in a context of imperfect contract enforcement and opportunistic behaviour by the contracting parties; this holds true irrespective of the organizational type of the contractor. The novelty of this Proposition is also that it clearly shows that the impasses that a nonprofit versus a for-profit contractor poses to government are costly in different ways -that is, the renegotiation costs are of a different *order.*

I now turn to the contractor's effort decision. Observe that after substituting for the renegotiation payment, the payoff of a for-profit is:

$$\tau\left(\theta_{gg} + b(e_f)\right) - c_f - e_f + T.$$

Thus, the first order condition for effort solves:

$$b'(e_f) = \frac{1}{\tau} \qquad (2a)$$

A nonprofit's payoff is then:

$$(1-\tau)\,\theta_{n\delta} + \tau\theta_{nn} + b(e_n) - c_n - e_n + T.$$

Effort solves:

$$b'(e_n) = 1 \qquad (2b)$$

Notice that the equilibrium level of effort chosen by a nonprofit or for-profit contractor now lies below its first best level. Evidently under imperfect contract enforcement, the contractor, nonprofit and for-profit alike, *underinvests* in quality improvements.

**Proposition 2.3** *A for-profit will ceteris paribus exert less effort to improve output quality than a nonprofit. Only if renegotiation is certain to occur, then the efforts chosen by the two agent types are the same. In addition, a for-profit's effort level increases with the likelihood of renegotiation. A nonprofit's effort level, in contrast, is unaffected by the likelihood of renegotiation.*

Proposition 2.3 confirms our intuition that a nonprofit will invest relatively more in quality innovations (compared to a for-profit). Furthermore, the Proposition provides an explanation for why a for-profit would voluntarily invest in costly quality innovations, given that she strives to maximize profits. From a for-profit's perspective, the rationale for choosing a positive level of $e_f$ is that $e_f$ effectively impacts the size of her anticipated renegotiation rent (i.e. $\tau t_f$). As $\tau$ falls, she takes less account of the positive consequences of $e$, and consequently expends relatively less effort in any quality enhancing activities. A nonprofit, by contrast, fully internalizes the positive consequences of $e$, and thus given $\tau$ strictly less than unity, always sets her effort to improve output quality at a comparatively higher level. Finally, the insight that the level of $e$ can be influenced by the likelihood of *ex post* renegotiation is novel. Glaeser and Shleifer (2001) have previously suggested that a for-profit's incentives to invest in non-verifiable quality improvements can be influenced by factors such as the non-cash cost of shirking on quality (like guilt) and the marginal cost of increasing service quality. Proposition 2.3 adds to this that a *for-profit*'s quality investment increases with the likelihood of contractual renegotiation.

When contracting with a for-profit, government is faced with a trade-off between providing incentives to improve output quality and reducing *ex post* transaction costs due to costly renegotiation. To see why this is true, observe that the level of contractual incompleteness ($\tau$) impacts both government's expected renegotiation costs and his anticipated loss due to the under-investment in socially desirable quality improvements. When contracting with a nonprofit instead, government ensures a relatively higher level of non-contractible

quality investment, but risks losing control over the project's design. To illustrate this latter point, consider the case where both agent types submitted the exact same initial bid, $(\delta, T)$. Let $\lambda \in \{n, f\}$ denote the contractor's type and $v(\lambda, \delta, T)$ be government's interim payoff. Then,

$$v(f, \delta, T) = (1-\tau)\left(\theta_{g\delta} + b(e_f^*)\right) - T$$

and

$$v(n, \delta, T) = (1-\tau)\,\theta_{g\delta} + \tau\theta_{gn} + b(e_n^*) - T.$$

Thus, for a fixed $(\delta, T)$, a *nonprofit* is preferred if

$$\tau\left(\theta_{gg} - \mu_g\right) + \left[b(e_n^*) - (1-\tau)\,b(e_f^*)\right] \geq 0. \quad (3)$$

This condition underlines that a nonprofit is *ceteris paribus* better for effort, but worse for opportunism in project design. As long as government's valuation $\theta_{gg}$ exceeds his loss $\mu_g$, (3) always holds. The fact that $\mu_g$ outweighs $\theta_{gg}$, however, is only a necessary, but not sufficient condition for government to prefer a for-profit candidate. Then, the lower the buyer's valuation of non-contractible quality (i.e., the smaller the returns to the non-contractible quality-enhancing investments) and/or the greater the discrepancy between $\mu_g$ and $\theta_{gg}$, the more likely it is that the for-profit type becomes government's preferred candidate.

Finally, I turn to the initial stage of the contracting game, and discuss the determinants of $(\delta_n, T_n)$ and $(\delta_f, T_f)$ in the competitive bidding process. I will show that nonprofits and for-profits pursue a different bidding strategy, and consequently dominate distinct aid market segments. Consider a bidding process, which proceeds in two steps. First, agents simultaneously and noncooperatively submit their bids. Second, government selects the bid that maximizes his expected utility. That is, he picks $\xi \in \{n, f\}$, using the following decision rule:

$$\xi = \begin{cases} n & \text{if } v(n, \delta_n, T_n) > v(f, \delta_f, T_f), \text{ and w/prob. } \frac{1}{2} \text{ if } v(n, \delta_n, T_n) = v(f, \delta_f, T_f) \\ f & \text{if } v(n, \delta_n, T_n) < v(f, \delta_f, T_f), \text{ and w/prob. } \frac{1}{2} \text{ if } v(n, \delta_n, T_n) = v(f, \delta_f, T_f) \end{cases}$$

A nonprofit can either compromise and align herself with government ($\delta_n = g$); or stand by her own mission and propose her own preferred design ($\delta_n = n$).

First, suppose that both agent types initially propose government's preferred project design; that is $\delta_f = \delta_n = g$. Both nonprofits and for-profits then make their most competitive

price offers.[11] Government will prefer the *for-profit* bid over the nonprofit bid if and only if :

$$\tau\mu_g + (1-\tau)\mu_n \geq \theta_{gg} + (c_f - c_n) + \left(2b(e_n^*) - b(e_f^*)\right) + \left(e_f^* - e_n^*\right) \qquad (4)$$

Thus, the for-profit types benefit from more disagreement over project design between government and nonprofit (see LHS of (4)). Expression (4) also links auctions wherein *only* for-profit contractors compete (henceforth, pure for-profit auctions) with service contracts from which nonprofits derive very little intrinsic value, where nonprofits are at a comparative cost disadvantage, where the losses to government and nonprofit from the "wrong project design" are large, and where the returns to non-contractible effort are relatively small. Inversely, auctions with *only* nonprofit bidders (henceforth, pure nonprofit auctions) are associated with services where the intrinsic benefits to the nonprofits from project realization are large, where nonprofits are at a comparative cost advantage, where the losses due to disagreement over the ideal project design to government and nonprofit are respectively small, and where the returns to quality improvements are high.

Second, suppose that the nonprofit agent proposes a bid with $\delta_n = n$. Like before, the agents make their most competitive price offers.[12] Government will then prefer the *for-profit* bid if and only if:

$$\mu_g \geq \theta_{nn} + (c_f - c_n) + \left(2b(e_n^*) - b(e_f^*)\right) + \left(e_f^* - e_n^*\right) \qquad (5)$$

A comparison of (4) and (5) shows that when $\mu_n > \mu_g$, a nonprofit can actually raise her chances of outbidding a for-profit tenderer by setting $\delta_n = n$. Conversely, when $\mu_n < \mu_g$, a nonprofit, if she competes, is *ceteris paribus* less likely to propose $\delta_n = n$. For the rest, since the RHS of (4) and (5) are identical, the same comparative static results, implied by the determinants of the agents' bidding strategies drawn out in the previous paragraph, apply here as well.

To summarize:

**Proposition 2.4** *A nonprofit's and for-profit's optimal bidding strategy and consequent contracting behaviour can be summarized as follows:*

1. *If* $Min(\tau\mu_g + (1-\tau)\mu_n, \mu_g) > \Omega$, *then only for-profits compete, with* $T_f = c_f + e_f^* - \tau(\theta_{gg} + b(e_f^*))$ *and* $\delta_f = g$. *With probability* $\tau$, *the for-profit contractor will make a renegotiation offer* $(\theta_{gg} + b(e_f^*), g)$.

[11] The values of these minimum price offers submitted by a non-profit and a for-profit equal, respectively, $c_n + e_n^* + (1-\tau)\mu_n - b(e_n^*) - \theta_{nn}$ and $c_f + e_f^* - \tau\left(\theta_{gg} + b(e_f^*)\right)$.

[12] The values of these minimum price offers submitted by a nonprofit and a for-profit equal, respectively, $c_n + e_n^* - b(e_n^*) - \theta_{nn}$ and $c_f + e_f^* - \tau\left(\theta_{gg} + b(e_f^*)\right)$.

2. *If either* $Max(\tau\mu_g + (1-\tau)\mu_n, \mu_g) < \Omega$, *or* $\tau\mu_g + (1-\tau)\mu_n > \Omega > \mu_g$, *then only nonprofits compete, with* $T_n = c_n + e_n^* - b(e_n^*) - \theta_{nn}$ *and* $\delta_n = n$. *With probability* $\tau$, *the nonprofit contractor will make a renegotiation offer* $(0, n)$.

3. *If* $\tau\mu_g + (1-\tau)\mu_n < \Omega \leq \mu_g$, *then only nonprofits compete, with* $T_n = c_n + e_n^* + (1-\tau)\mu_n - b(e_n^*) - \theta_{nn}$ *and set* $\delta_n = g$. *With probability* $\tau$, *the nonprofit contractor will make a renegotiation offer* $(0, n)$.

*where* $\Omega \equiv \theta_{nn} + (c_f - c_n) + (2b(e_n^*) - b(e_f^*)) + (e_f^* - e_n^*)$

Proposition 2.4 reveals three key insights. First, the Proposition shows that under imperfect contract enforcement, there essentially exist three mutually exclusive contracting outcomes. The first possibility is that *only for-profits* compete. This occurs e.g. when the ideological divide between government and nonprofit is sufficiently high (costly). The second possibility is that *only nonprofits* compete and are able to take control over project design straight through the project's implementation. The third possibility is that *nonprofits* again are at a competitive advantage relative to for-profits, but that the relative benefits to government from contracting with a nonprofit are not sufficiently high for nonprofits to be able to take control over the project's design right from the beginning. Second, the Proposition also reveals that not only the pattern of nonprofit and for-profit specialization, but also the nature of the 'deal' a nonprofit or for-profit proposes critically hinges on the relative size of each agent type's comparative advantage. For instance, the stronger (weaker) a nonprofit's comparative (dis)advantage, the more leverage she has to push through her own preferred project design at the initial contracting stage. At the same time, when $\delta_n = n$, the threat to the buyer of costly renegotiation essentially disappears: the buyer then neither gains nor loses from *ex post* renegotiation. Finally, the Proposition exposes that a for-profit will always dance to the government's piping. To see why, observe that at the bidding stage, to adhere to the government's demands straightforwardly raises the for-profit's chances of winning the contract, notably at no cost to the for-profit. Once the contract is under way and the opportunity to renegotiate the contract arises, then continuing to adhere to the government's demands is again in the for-profit's best interest: By doing so, she maximizes the size of the renegotiation surplus.

In reality, we observe that both for-profits and nonprofits sometimes compete against each other. By relaxing the perfect information assumption, the baseline model is readily modified to account for such instances. Suppose that the agents are imperfectly informed about some of the parameter values, like their rival's costs of service delivery ($c_f$ or $c_n$),

that affect their optimal bidding decisions. Then, straighforwardly, it is conceivable that a 'mixed auction' takes place.

Also, I point out the effects of $\tau$ on (4) and (5), and consequently on the likelihood that for-profits and nonprofits will compete. If $\mu_n > \mu_g$, then a marginal rise in contractual imprecision ($\tau$) unambiguously diminishes the likelihood that a pure for-profit auction occurs. Else, the net effect is ambiguous (For proofs, see Appendix A: Mathematical Appendix).

Finally, the model yields three main (readily) testable predictions. First, nonprofits will tend to compete for aid projects where there exists high returns to non-contractible quality innovations, government finds strict adherence to the initial "Terms of Reference" relatively less important and/or nonprofits reap substantial intrinsic gains from project realization ($b(e)$ and $\theta/\mu-$Prediction). Second, the initial offers of for-profits will on average adhere better to the government's service delivery instructions compared to those of nonprofits ($\delta-$Prediction). Finally, government's *ex post* transaction costs will tend to be substantially higher when the agent is a for-profit compared to when the agent is a nonprofit ($t$-Prediction). Each prediction emphasizes the important role that organizational form -identity or mission- plays in shaping a candidate contractor's bidding and contracting decisions. The model thus suggests that organizational form has implications well beyond patterns of specialization; organizational form also shapes the actual contracting relationship.

## 2.3 Contracts and Data

I want to use the predictions of the model to investigate the relationship between a firm's organizational form and its competitive bidding and contracting strategy specifically in the context of aid. As alluded to in this Chapter's Introduction, the special procurement setting that I exploit is that of the competitive scoring auction, a widely and ever more used auction format by governments to allocate public service contracts (see e.g. Asker and Cantillon, 2006). This section describes the data, but also gives some contextual background. The purpose of the latter is twofold: (i) to show that the assumptions in the theoretical model fit well with the structure of the market for aid contracts and DFID's procurement practices, and (ii) to describe in some detail the way these scoring auctions work.

### 2.3.1 Contracts

The UK's aid procurement market is essentially segmented in competitive, non-competitive and call-down contract awards.[13] I focus on the market for competitive aid service contracts for two reasons. First, the data on bids for competitively awarded contracts is remarkably detailed. They include information about DFID's assessment of each bid on a host of ex ante fixed selection criteria, as well as details of each bid's proposed outline of costs. This allowes us to readily compare bids (for a same aid service contract) along both price- and quality-related dimensions. Similar data is non-existent for the other two contract types. Second, competitive aid service contracts currently represent the overwhelming majority of all newly issued aid service contracts.[14]

All competitive contracts are let through a competitive bidding process. These auctions work as follows: Initially, DFID drafts the "Terms of Reference" (TOR), and selects the scoring rule. Then, DFID publicly announces the consultancy opportunity, the selection criteria and decision weights, and asks contractors in the market to submit bids –entry to the auction is open (since April 2001 not just UK based organizations but effectively any firm across the globe) and free of charge. Each bid consists of a "Commercial Tender," which is essentially the proposed outline of costs, and a "Technical Tender," which explains how the contractor intends to execute the project. For each incoming offer, DFID computes a final score using the ex ante specified scoring rule. Finally, the firm with the highest score wins the contract, which means that this firm implements the project –notably, by and large as stipulated in her initial bid, at a not-to-exceed, contractually agreed price. Thus, DFID is obliged to reimburse the costs of inputs (specifically, personnel fees and project expenses) up to a maximum sum or ceiling. Any requests for extra payments must be renegotiated first, and if accepted, cast as a contractual amendment. Figure 1 presents a general overview of the initial steps in DFID's procurement process.

In the theoretical model, I assume that the auction of an aid service contract is effectively competitive. Evidence in support of this assumption is that the 25-firm concentration ratio for my sample is only 0.61, i.e., the value of all contracts awarded to the top 25 firms accounted for 61 percent of the total (see Tables 1 and 2). Moreover, on average 2.7 tenderers competed for each contract included in the sample, and nearly 70 percent

[13] An example of non-competitive contracts are negotiated agreements with single-suppliers. Call-down contracts are similarly non-competitive; however, they draw on Framework Agreements or Resource Centres, which are typically competitively awarded contracts. These contracts simply state that the contractor promises to provide certain types of services at contractually agreed rates whenever DFID finds a need for them.

[14] The value of competitive contracts has increased substantially over the last two decades, and now accounts for nearly 90% of the total (own calculations based on DFID's Procurement Department own statistics for fiscal years 1997/98 through 2004/05).

of all contestants bidded only once. The Herfindahl index based on initial contract value and number of contracts (again, for my sample only) equaled, respectively 0.051 and 0.023, thus suggestive of a market that is unconcentrated, where competition intensity is typically high.

The theoretical analysis also treats contract precision as an exogenous variable. This rhymes well with my own observation that DFID's procurement agents do not actively decide over the TOR's precision. But also, it fits with the data: specifically, I cannot reject the hypothesis that average "TOR's precision" (a variable on which I collected data) is the same irrespective of who –i.e., which type of agents– competes.[15]

Finally, there are several additional reasons why DFID *in particular* presents an important case study for testing our ideas. Firstly, DFID is widely regarded as a global leader in development thinking and practice (Barder, 2005), a model for other rich countries. Also, DFID has been contracting-out aid projects much like today since the early eighties.[16] And importantly, both nonprofits and for-profits have been tendering for these contracts –of all bids put forward between 1999 and 2003, nonprofits accounted for approximately 30 percent.

### 2.3.2 Data

My unit of observation in some parts of the analysis is the bid for DFID's aid service contract, and in other parts the actual contractual relationship between DFID and the winning contractor. I index the projects or contracts by $i = 1, ..., N$; I will also let a subscript $i$ index the value of any variables for project/contract $i$. For instance, $n_i$ denotes the number of contractors who compete for contract $i$. The sample[17] includes N = 458 projects with an aggregate value of £130 million, awarded to 225 distinct firms.[18] There were a total of 1,222 bids submittted by 459 distinct firms based primarily in the UK.

Of the 459 distinct contestants, slightly over 60 percent were by legal status for-profit

[15] We cannot reject the null hypthesis that the means of TOR precision for contracts let in pure nonprofit auctions, pure for-profit auctions and mixed nonprofit-for-profit auctions are equal.

[16] Before then, consultants were employed when needed, more in an ad hoc fashion. But throughout our period of study, DFID has consistently applied the same mandatory procurement and contracting procedures. For a more detailed description of these procedures, please refer to Appendix C: Details about DFID's Contracting Process.

[17] For a more detailed discussion of the sample and the sample selection process, please refer to Appendix B: Data Appendix.

[18] This measure of market size captures the total value of all *initial contracts* only. Since payments from ex post adaptations can be considerable, as the data reveals, the value of contracts including all contractual amendments is substantially higher.

firms. Not only larger in number, for-profits also bidded on average more frequently than nonprofits. Indeed, about 70 percent of all bids hailed from for-profit organizations. The nonprofit group comprises all public or private organizations that cannot lawfully distribute their financial surplus to those in control of the organization; that is to say, charities, academic institutions, government bodies as well as membership based and network organizations. Within this group, academic institutions were most numerous (representing 38 percent of all nonprofit organizations), yet together did not account for the largest fraction of nonprofit bids. Instead, the charities competed more vigorously, submitting on average 2.54 bids, and thus representing the largest share of nonprofit bids.

For my purposes, it is useful to differentiate three possible auction categories based on which type of agents competes: in 47 percent of the auctions in our sample, only for-profits competed, in 17 percent only nonprofits competed and in the remaining 36 percent at least one nonprofit and one for-profit competed. Summary statistics for each of these three auction categories are provided in Table 3. There is noticeable heterogeneity in the size of projects awarded, both within and between auction categories. The overall mean value of the winning bid is £295,829 with a standard deviation of £501,467. On average, the projects require just over twenty months to complete. The final price paid for the work exceeds the winning bid by an average of £88,771, or about 32 percent of the estimate. This discrepancy is most pronounced for projects procured through pure for-profit auctions (i.e., auctions where all the competitors are for-profits). Compensation for additional project expenses and personnel costs through contractual amendments, as well as deductions, contribute to this difference, amounting to respectively 37 and 26 percent of the initially agreed estimate.

As panel B of Table 3 shows, pure nonprofit auctions in the study (i.e., auctions with nonprofit competitors only) exhibited a lower intensity of competition relative to mixed and pure for-profit auctions. E.g., the average number of competitors in a pure nonprofit auction was below the overall average. However, overall, as emphasized in the previous subsection, the three market segments were remarkably unconcentrated (see e.g. the Herfindahl indices).

For each project, I collected information from DFID's paper archives and electronic database system on the selection criteria and weights assigned to each dimension, each bid's financial offer, and performance on each of the selection criteria used, and each project's sector and discipline type. There exists considerable heterogeneity in the size of the decision weights used to evaluate each bid. At the same time, the overall ranking of criteria is often the same: quality of personnel and methodology are typically assigned the highest weights, whereas procurement management and the commercial assessment are typically assigned the lowest weights.

I also photocopied the TOR of each project and had two independent judges rate these project descriptions on half a dozen dimensions, ranging from the precision with which the tasks are specified to the public goods nature of the project to the relative significance of labour inputs to the project's realization.[19] This has allowed me to construct estimates of otherwise hard to observe variables, but which play an important role in our theoretical analysis. It has also allowed me to describe the actual aid service with much detail, which I exploit to guard against omitted variable bias due to simultaneity.

Table 4 provides descriptive statistics of the decision weights and TOR ratings for each auction category. It tells us that along many of these dimensions, the average competitive contract in each auction category look fairly similar. Exceptions include the weights assigned to the commercial asssessment and country experience criterion, the means of which do differ significantly between pure for-profit auctions and the other two auction types. Similarly, the mean value of a project's public goods nature in pure forprofit auctions is statistically different from those in pure nonprofit and mixed auctions.[20]

Finally, it is noteworthy to non-governmental organizations evidently perform a wide array of functions under contract. The competitive service contracts relate to a broad set of sectors (ranging from education to construction), as well as draw on a diverse range of discipline expertise (ranging from feasibility studies to project coordination). Services in the areas of business and finance, and health, population and social development together account for the majority (68 percent) of all contracts.

## 2.4 Empirical Analysis

Propositions 2.2, 2.3 and 2.4 provide the basis of my empirical tests. They yield three testable empirical predictions: First, nonprofits will tend to compete for aid projects where there exists high returns to non-contractible quality innovations, government finds strict adherence to the initial "Terms of Reference" relatively less important and/or nonprofits reap substantial intrinsic gains from project realization ($b(e)$ and $\theta/\mu-$Prediction). Furthermore, the initial offers made by nonprofits will, on average, adhere less to the project's "Terms of Reference" than the initial bids submitted by for-profits ($\delta-$Prediction). Finally, the government's *ex post* transaction costs when contracting with a for-profit will

[19] For more details about the definition of these variables, please refer to the Appendix B: Data Appendix and Appendix: Figure 1.

[20] Formally, we cannot reject the null that the means of the weight assigned to methodology for any two auction categories are the same. Also, the average weights assigned to the commercial asssessment and country experience criterion in pure for-profit auctions are both significantly dissimilar to those in pure nonprofit or mixed auctions.

be substantially higher than when contracting with a nonprofit ($t$-Prediction).

I examine whether patterns of nonprofit and for-profit auction entry are consistent with my model. That is, can my model uniquely explain differential patterns of specialization between nonprofits and for-profits? Next, I investigate empirically the relationship between organizational form, that is, nonprofit (or for-profit) status, and contractual form.

### 2.4.1 Auction Entry Decisions

The model predicts that nonprofits and for-profits will each specialize in a limited and distinct set of aid service contracts. Proposition 2.3 and 2.4 imply that not only cost advantages but also other *differentiation* advantages – i.e., competitive advantages based on differences in commitment of higher non-contractible effort investments, willingness to execute the buyer's desired project design and intrinsic valuation of a project's outcomes– should play a prominent role in a nonprofit's and for-profit's choice of specialization. Evidently, since nonprofits are unable to obtain equity capital,[21] they are expectedly at a competitive cost disadvantage when the service contract at hand is big (that is, of high monetary value). But Propositions 2.3 and 2.4 also uniquely point to several other important factors that affect whether a nonprofit (or for-profit) is at a competitive advantage given a project contract under focus. For instance, the fact that a nonprofit will *ceteris paribus* exert higher $e$ (recall Proposition 2.3) should give a nonprofit a competitive advantage when $e$ or $b(e)$, the returns to $e$, are relatively more important. Therefore, when a project has a strong public goods component, I expect relatively more nonprofit bids.[22] Similarly, the fact that a nonprofit, notably her employees and volunteers, (tend to) intrinsically care about a project's outcomes should put a nonprofit at a competitive edge when e.g. labour input plays a major role in the project's outcomes.[23] However, a nonprofit's specific mission or identity can also be a weakness, particulary when government knows precisely what he wants. When government finds it important that the contractor

[21] See e.g. Hansmann (1996). Frumkin and Andre-Clark (2000) identify the financial constraints that many nonprofits face as a significant obstacle to participation in welfare reform contracting. US welfare reform performance contracts often withold part of the firm's fee until a client has been placed in a job or has retained a job for some months. If a contractor receives all or part of its fees only months after placing a recipient, it must find a way to pay the costs of its services while it waits for those fees to arrive. Nonprofits typically experience difficulty in raising the capital to meet these expenses -For one, because nonprofits are ownerless organizations and cannot sell shares, initial public offerings are not an option. Aid contracts are typically of the cost-reimbursable type, which similarly requires the contractor to be able to advance any project expenses.

[22] To illustrate, if the project has a clear public goods component, then any non-contractible quality investments will benefit society at large.

[23] E.g., if the project demands a high labour input, then this arguably raises a nonprofit's intrinsic project valuation through an enhanced sense of autonomy or self-determination in the project delivery process (Deci, 1999).

closely adheres to his instructions, for-profits possess a natural competitive advantage; for-profit status is a credible commitment to executing a buyer's ideal project strategy (recall Proposition 2.4).

To test these predictions empirically, I estimate the following basic equation:

$$\eta_{ij} = \log\left(\frac{\pi_{ij}}{\pi_{i3}}\right) = \alpha_j + \mathbf{x}_i'\beta_j + \varepsilon_{ij}, \quad (6)$$

where $\pi_{ij}$ denotes the probability that the auction for project $i$ falls in the $j$-th category, with $j$ indexed as 1 if the auction is a 'pure nonprofit auction', 2 if 'mixed' and 3 if a 'pure for-profit auction, and $\alpha_j$ is a constant for $j = 1, 2$. $\mathbf{x_i}$ is a vector of project- and TOR-specific variables that proxy for the distinct sources of advantage identified in Propostion 4 and illustrated in the previous paragraph. Its elements are *ex ante* observable characteristics, i.e., known to the firms when deciding whether to compete for a contract. Specifically, $\mathbf{x_i}$ includes controls for the project's discipline and sector type, as well as a measure of the project's public goods nature, of the significance of labour inputs to the project's outcomes, of contract size, and of "Adherence Significance"[24]. $\varepsilon_{ij}$ is the project-level error term. The vector of coefficients $\beta_j$ are the parameters of primary interest.

In addition to the basic specification in equation (6), I also estimate a specification adding year fixed-effects. The year fixed-effects control for any variation in auction entry decisions within each auction category that is due to macro-economic shocks that uniformly impacted bidding decisions within a given category in any given year.

The first two columns of Table 5 represents the regression as suggested by the basic model. The regression analyses yields three important results. First, consistent with the (more traditional) cost advantage argument, increases in contract size decrease the odds of a pure nonprofit auction (relative to a pure for-profit auction), and benchmarked against projects in commerce and tourism, services in the energy, construction and extractive industries are statistically significant negative predictors of the odds of a pure nonprofit auction. To illustrate, if I were to increase contract size by £100,000, the multinomial log-odds of a pure nonprofit auction relative to a pure for-profit auction would be expected to decrease by around 0.2 while holding all other variables in the model constant. Second, the greater the project's public goods nature and relative importance of the labour inputs the more likely it is that only nonprofits compete. Further, the results show that the multinomial

[24]The variable "Adherence Significance" is a measure of the buyer's perceived benefits from close agreement with the contractor on the issue of project design implementation. The variable is constructed as the rating of the TOR's precision multiplied by the weight assigned to the adherence to TOR-dimension. So the greater the value of the "Adherence Significance", the more I expect that only for-profits will compete.

logit for education-related projects relative to projects in commerce and tourism is significantly higher for pure nonprofit auctions relative to pure for-profit auctions given the variables in the model are held constant. Finally, I establish that "Adherence Significance" significantly raises the odds of a pure for-profit auction. These three results are robust to the inclusion of year fixed-effects.[25]

Incidentally, notice that the aid service contracts for which both nonprofits and for-profits compete combine elements of nonprofit and for-profit competitive advantage as identified in Proposition 2.4. In size and public goods nature, they have not been found to be statistically different from projects that elicit for-profit bids only. On the other hand, with respect to adherence and labour input significance, they appear more similar to the type of projects that attract nonprofit bids only.

Finally, an outstanding, unexplored issue that relates to this subsection's focus on auction entry decisions is whether the untying of aid has in fact changed aid supply composition, firm strategy and competition. Since 70 percent of the contract awards in my sample were issued before aid untying (i.e., before April 2001), the data does not allow me to conclusively evaluate such impacts of aid untying. Nevertheless, several interesting patterns emerge. The results in Table 6 suggest that aid untying, in its initial phase, has propelled more distinct organizations to compete, though failed to provoke an immediate rise in competition intensity. Furthermore, following the untying of aid, for-profits in particular have strengthened their presence in the competitive aid market. Thus, the initial three-year period after the untying of aid witnessed a shift in the composition of tendering agency types, for-profits substituting for nonprofits. For-profits thereby maintained, or even slightly increased, dominance in sectors traditionally associated with for-profit activity, such as commerce, energy and transport (see Table 7). Simultaneously, they substantially increased their share of bids for projects in domains typically linked with nonprofit activity, such as health, population, development and education. Finally, whereas the group of for-profits has strengthened its presence in auctions for relatively small volume contracts, nonprofits started entering auctions for very large volume contracts following the untying of aid. Furthermore, our evidence suggests that nonprofits thereby ventured into 'traditionally for-profit' areas of expertise, such as commerce, and financial and business services.[26]

[25] The coefficients of the year dummies (though not reported in Table VI) are highly significant and negative for the mixed auction category only. This suggests that the downward trend in the frequency of mixed auctions relative to pure for-profit auctions. However, it might also be a consequence of the way we selected our contracts: since contracts procured via mixed auctions last on average the longest (nearly two years), the chances that they were selected into our database in later years logically falls.

[26] As an aside, I also empirically examined whether repeat or experienced (for-profit) bidders are more sophisticated contenders, that is, whether they tend to compete when few others do and hence when the chances of winning are great. However, the evidence lends no support to this hypothesis.

### 2.4.2 Contractual Form

#### 2.4.2.1 The Initially Agreed Contract

Proposition 2.4 highlights that the initial offers for $\delta$ could systematically differ across for-profit and nonprofit bids. This implies that even the initially agreed contracts with nonprofits versus for-profits will not tend to coincide. The model predicts that relative to nonprofit offers, initial offers by forprofits will *ceteris paribus* better comply with the buyer's wishes -i.e., the buyer's instructions or "terms of reference."

To test this prediction empirically, I run a simple OLS regression for contractors $c$ bidding for project $i$ of the following form:

$$Y_{ic} = \alpha + \beta N_c + \mathbf{x}_i'\gamma + \nu_i + \varepsilon_{ic} \quad (7)$$

where $Y_{ic}$ is the bid's percentage score on the "adherence to the TOR"-dimension, $\alpha$ is a constant, $N_c$ is a binary variable, which indicates the nonprofit status of the contractor, $\mathbf{x}_i$ is a vector of *ex ante* known project-specific characteristics, $\nu_i$ are project fixed effects to control for unobservable project-specific characteristics, and $\varepsilon_{ic}$ is the bid-level error term.[27] The nonprofit coefficient $\beta$ is the parameter of primary interest.

I also estimate $\beta$, adding the weight attached to the adherence score in the overall score rule as an extra control. This allows me to verify that the correlation between nonprofit and adherence score is not driven by the fact that adherence simply matters less in those auctions wherein nonprofits compete and that nonprofits therefore put in less effort to score high on that dimension. If with the adherence weight included the estimated $\beta$ remains negative and statistically significant, then this would support my conjecture that nonprofits on average adhere to the TOR because they value taking control over project design relatively more. Finally, I add as covariates the two TOR-specific characteristics, namely TOR-precision and the extent to which monitoring/evaluation provisos are included in the TOR because these factors are potentially correlated with both the adherence score and nonprofit 'auction entry/participation'.

Table 8 summarizes the results. I find that nonprofits score on average 3.5 percentage points below for-profits on the adherence dimension given all the other predictor variables in the basic model are held constant. The regressions presented in columns (2) and (3) show that this estimated effect is robust to the inclusion of additional covariates.

[27] As in marriage markets, it is plausible that the matching of the buyer with one contractor (and not with its rivaling candidates) will affect the bidders' subsequent auction entry decisions. Therefore, equation (7) will be estimated with robust standard errors clustered by bidder.

Finally, as an aside, I compare the initial offers in terms of the transfers ($T$) demanded across nonprofit and for-profit firms. The nonprofit sector is widely perceived as requiring workers to take pay cuts for the privilege of meaningful work (see e.g. Francois, 2000). In competitive scoring auctions for aid services, such a wage penalty should allow nonprofits to make lower priced bids for an identical consultancy opportunity. A major shortcoming of existing empirical work is that if unobserved heterogeneity in consultant talent or service quality is correlated with organizational form, then they cannot separate the effect of marginal talent or quality on pay differentials from any effect resulting more directly from differences in objectives, independent of differences in consultant ability or service quality (see e.g. Ballou and Weisbrod, 2003; Malani and Choi, 2004). Fortunately, the availability of data on 'quality of personnel' and 'quality of the bid' enables me to separately identify these three effects on bid prices.

To test for the existence of a nonprofit wage penalty, I run a simple OLS regression for all contractors $c$ bidding for project $i$ in *mixed auctions only* of the following form:

$$C_{ic} = \alpha + \beta N_c + \mathbf{x}_{ic}'\gamma + \nu_i + \varepsilon_{ic} \quad (8)$$

where $C_{ic}$ is one of three proposed transfer measures, $\alpha$ is a constant, $N_c$ is like before a binary variable, which indicates the nonprofit status of the contractor, $\mathbf{x}_{ic}$ is a vector whose elements proxy for the bid's quality –specifically, the percentage score of the bid on respectively the "Quality of Personnel" and "Methodology" dimensions, $\nu_i$ are project fixed effects to control for unobservable project-specific characteristics, and $\varepsilon_{ic}$ is the bid-level error term. The nonprofit coefficient $\beta$ is again the parameter of primary interest.

Table 9 reports the results for three different proposed cost measures: proposed total costs per day input, proposed personnel costs per day input, and proposed project expenses per day input. I find support for a nonprofit wage penalty. For instance, the column (2) estimate suggests that nonprofit status is associated with reduction in average proposed per day personnel costs of £74.[28] Furthermore, the results suggest that neither "Quality of Personnel" nor "Methodology" is consistently, significantly correlated with any of the three proposed cost measures. This implies that a higher price does not necessarily reflect higher quality services; in fact, despite their on average higher price, for-profit bids do not appear to promise better 'value for money.'

[28] Note, however, that the evidenced differential in proposed personnel fees is in fact only suggestive of the existence of a wage penalty. With the data at hand, I cannot rule out the possibility that in fact an employee at a for-profit earns a similar salary as his equivalent at a nonprofit, and that the cost differential is caused by a difference in overhead costs.

#### 2.4.2.2 The Renegotiated Contract

Lastly, the model predicts that contracting with a for-profit will involve substantially larger *ex post* or renegotiated transfer payments (relative to contracting with a nonprofit) but no loss of buyer control over issues of project design. Renegotiated *extra* transfer payments and *ex post* loss of control represent, as identified in Proposition 2.2, are the main two types of renegotation costs that a buyer faces.[29]

To test this prediction empirically, I run the following basic OLS regression for each contract $i$:

$$R_i = \alpha + \beta N_i + \mathbf{x}_i'\gamma + \varepsilon_i \quad (9)$$

where $R_i$ is a measure of renegotiation costs, $\alpha$ is a constant, $N_i$ is a dummy variable for when the contractor is a nonprofit or a for-profit, $\mathbf{x}_i$ is a vector whose elements are characteristics of the initial contractually agreed financial agreement. Once again, the nonprofit coefficient $\beta$ is the parameter of primary interest.

Again, to guard against omitted variable bias due to endogeneity, I sequentially expand the set of covariates. I add as a covariate a dummy variable for when the services procured are in social fields, like education, health, population and social development or renewable resources. I also include a measure of contractual incompleteness as an explanatory variable.

Table 10 summarizes the results. The first three columns present the regression results with the cost overruns as a share of the initially agreed costs with respect to *personnel fees* as the dependent variable. First, we find that nonprofit status exhibits a significant negative correlation with renegotiated (extra) personnel fees as a share of initially agreed personnel fees. Adding the dummy variable for whether the services are in the social sector lowers both the economic magnitude and statistical significance of our coefficient of interest.[30] Nevertheless, the coefficient remains statistically significant. Indeed, column (3) estimate reveals that personnel fee overruns as a fraction of the initially agreed personnel fees when the contractor is a nonprofit is around 17 percent lower than when the contractor is a for-profit.

Second, the results show that total renegotiated personnnel fees as a share of the initially agreed personnel fees are substantially lower -specifically, on average 12 percent lower-

[29] Unfortunately, I do not have any data that would allow me to test whether the renegotiation offer of nonprofits involved a new design that fits better with the nonprofits' ideals.

[30] This suggests that our concerns with the potential (here negative) omitted variable bias are appropriate or valid. To see why this is the case, recall that these social services raise the odds of a pure nonprofit auction and observe that a project's social character is significantly negatively correlated with the size of renegotiated personnel fees.

when the project is a social service relative to all other project types. Third, if we were to increase the project duration by a 100 days, the average renegotiated personnel fees as a share of initially agreed personnel fees is expected to increase by approximately 5 percent. Finally, the coefficient on our measure of TOR precision is as expected negative, yet statistically insignificant.

Columns (4)-(6) report similar regression results but now with renegotiated *project expenses* as a share of initially agreed project expense payments as the dependent variable. Interestingly, the estimated coefficient on nonprofit remains large and statistically significant: The results reveal that contracting with nonprofits is associated with a reduction of about 30 percent in the ratio of cost overruns with respect to project expenses over initially agreed project expense transfers. The findings also suggest that longer term projects are associated with higher cost overruns for project expenses as a share of initially agreed project expense transfers. Finally, TOR precision is again a negative, yet statistically significant predictor of the relative size of cost overruns regarding project expenses.

I also estimated equation (9) for the restricted sample of projects procured through mixed auctions only. This subset of projects are arguably better comparable, and hence the estimated coefficients in (9) are less likely to be contaminated by selection effects. The findings in Table 11 corroborate those presented in Table 10, in fact showing that the difference in the relative size of renegotiation costs between nonprofit and for-profit contractors becomes more pronounced when considering the subsample.

To summarize, I find support for the model's three main testable predictions; in other words, the data are consistent with the proposition that there exists a significant relationship between a firm's organizational form and its bidding and contracting behaviour. This suggests that the *real* contracting risks government faces when procuring aid services from private enterprises systematically vary with the firms' organizational form.

## 2.5 Conclusion

I have provided a tractable model of competitive bidding for inherently incomplete aid service contracts with two types of contestants -for-profits who simply maximize profits and nonprofits with a distinct mission, who care about the project's outcomes and the ways these outcomes came about. I have shown that *ex post* renegotiation costs as well as initial price offers will be higher when the contractor is a for-profit; at the same time, by contracting with a for-profit, government essentially secures her (agenda-setting) control over the design of the contracted-for service. When contracting with a nonprofit,

government effectively ensures a higher level of non-observable quality investment into the project, but risks losing control over the project's design. I have thus revealed that organizational form has implications well beyond patterns of specialization; organizational form effectively impacts the nature of the contract itself with government.

I have also described in detail the bids for aid contracts by nonprofits and for-profits and the contracts between government and nonprofits and for-profits. I have compared the actual bids and contracts to the predicted ones in my model. I have found that nonprofits typically competed for aid projects with a strong public goods component and with high returns to intrinsic motivation of personnel, as one would expect from my theory. Also, nonprofits adhered less to the projects' terms of reference than did the for-profit bids, and for-profits were more likely to request additional funds to complete their projects (due to cost-overruns and the like) after the contract had been signed. My theory does well in explaining these empirical results.

My findings reveal several important weaknesses in the standard design of aid procurement auctions and contracts. Firstly, the very large *ex post* renegotiation costs with for-profit contractors [running up to, on average, 30% of the originally agreed price!] suggest two non-trivial issues. (i) reputational concerns as a disciplinary mechanism are apparently at best weak, and (ii) for-profit contractors have apparently weak incentives to undertake cost-reducing efforts. To remedy the first problem, DFID could build a database that systematically documents or tracks the *ex post* renegotiation decisions of (especially, but not only) for-profit contractors, and use this information when evaluating new bids. In response to the second issue, DFID could make use of a different contract design (see e.g. incentive pay contracts or fixed price contracts) that credibly shifts responsibility for cost-overruns to the contractor. Other efficient means to redress these concerns include e.g. unbundling the services or incorporating the idea of the collective contracting mechanism (Huysentruyt, 2008)! A second concern relates to my finding that the level of competition intensity in those auctions where only nonprofits competed was relatively lower. This suggests a need to reduce the entry barriers to compete for aid service contracts (in particular) for nonprofits. Free training on how to produce a tender, as an example, could help to raise average competition intensity. Thirdly, the evidence indicates that $\tau$ (or the level of precision with which the TOR of a project is defined) does not systematically (strategically) vary across auction type category. However, it can be easily proven that endogenizing $\tau$ (i.e., setting $\tau$ strategically) could allow government to reap additional efficiency gains.[31]

One outstanding, important topic for future research is to map out the implications of

[31] Please refer to Appendix A: Endogenizing Contract Precision for a more detailed discussion on the possible role of TOR precision as a strategic choice variable.

organizational differences in contracting behaviour for aid effectiveness. By linking data on service delivery performance (based on project evaluations) to the data set used in this paper, I hope to be able to make some progress in this direction. Also, as competitive tendering processes proceed apace, estimating the effects of certain types of nonprofits and for-profits –local and foreign, religious and secular, small and large– on contractual outcomes represents an important area for future research. Again, I defer such analyses to future work.

**Appendix A: Mathematical Appendix**

*Contract precision* - If $\mu_n > \mu_g$, then a marginal rise in $\tau$ unambiguously diminishes the likelihood that a pure for-profit auction occurs. Else, the net effect is ambiguous. To see why, observe that the derivative of the RHS in (4) and (5) with respect to $\tau$ equals:

$$\left(\frac{\partial e_f}{\partial \tau}\right)\left(1 - b'(e_f^*)\right)$$

Recall Proposition 3, which says that $\partial e_f/\partial \tau$ is positive. In expression (2a), we also established that $b\prime(e_f^*) = 1/\tau$ so that $1 - b\prime(e_f^*) \geq 0$. Thus, a marginal increase in contract imprecision raises the righthand-side value in (4) and (5). Now, if in addition, $\mu_n > \mu_g$, then a marginal increase in contract imprecision decrease the lefthand-side value of (4). Then, clearly the more imprecise the contract's specifications, the more likely it is that only nonprofits will compete. If both $\mu_g \geq \mu_n$, then the net effect of a marginal rise in $\tau$ on the chances that a pure for-profit/nonprofit auction occurs is ambiguous.

*Endogenizing contract precision* - Let us examine how a buyer would optimally set $\tau$ if she could influence $\tau$ through her choice of effort to make the project's instructions more precise. Firstly, I need to introduce some notation. Let $T$ be a measure of the project's complexity, namely the number of states of nature that can occur *ex post,* and let $\pi_t > 0$ be the probability that state $t \in \{1, ..., T\}$ occurs. Each state of nature must be anticipated *ex ante* to completely design the project, and assume that the cost of specifying a state of nature is $k > 0$ regardless of the state of nature. Also assume that $\pi_t > \pi_{t+1}$ for all $t \in \{1, ..., T-1\}$. These two assumptions imply that from a cost-benefit analysis it is better to first specify a design for state 1, then for state 2, and so on. Keeping $\theta_{g\delta}$ fixed, a project is characterized by the pair $\langle T, \{\pi_t\}_{t=1}^{T} \rangle$. Consider a buyer who wishes to write down a contract for project $T$ to guarantee that the project is well specified with probability at least $(1 - \tau) \in [0, 1]$. The cost of contractual completeness can be expressed as:

$$\begin{aligned} C(1-\tau,T) &= \min_{S\in\{1,\ldots T\}} Sk \\ s.t. \sum_{t=1}^{S} \pi_t &\geq (1-\tau) \end{aligned}$$

$C(\tau,T)$ is smooth, increasing and convex in $(1-\tau)$ and $T$, and exhibits increasing differences in $(1-\tau,T)$. With probability $(1-\tau)$ the original contract accurately describes the project, and there is no need for contractual renegotiation. With probability $\tau$, however, contractual modifications are neccessary to complete the project.

Now, I turn to the buyer's 'contract design' decision, and will show that the optimal level $\tau$ changes with the contractor's type. Consider first the case when the buyer expects to contract with a *nonprofit*. Suppose that the nonprofit initially sets $\delta_n = g$. Before issuing a call for tenders, the buyer must decide the level $(1-\tau_n^*)$, which maximizes his expected indirect utility:

$$\theta_{gg} + \theta_{nn} - \tau\mu_g - (1-\tau)\mu_n + 2b(e_n^*) - c_n - e_n^* - C(1-\tau_n^*, T).$$

Thus, the optimal contract precision, $1-\tau_n^*$, solves:

$$\mu_g - \mu_n = \frac{\partial C(1-\tau_n^*, T)}{\partial(1-\tau)}. \qquad (a)$$

At the optimum, the marginal benefit of exerting effort to improve the contract's completeness must equal the marginal cost of that effort. The greater the difference between $\mu_g$ and $\mu_n$, the greater the optimal level of contract design precision.

In situations where the buyer expects the nonprofit to propose $\delta_n = n$, she should set $1-\tau_n^* = 0$. Then, to make the contract more precise is solely costly; it leaves the buyer's expected gross project benefits unaffected.

Next, I turn to the case when the buyer expects to contract with a *for-profit*. Again, the buyer will choose $1-\tau_f^*$, which maximizes his expected indirect utility:

$$\theta_{gg} + b(e_f^*) - c_f - e_f^* - C(1-\tau_f^*, T).$$

The optimal contract precision, $1 - \tau_f^*$, solves:

$$\left(1 - b'(e_f^*)\right) \frac{\partial e_f^*}{\partial \tau} = \frac{\partial C(1 - \tau_f^*, T)}{\partial (1 - \tau)}. \qquad (b)$$

Replacing $b'(e_f^*)$ with $1/\tau_f^*$ (Condition (2a)), and rearranging terms yields:

$$\tau_f^* = \frac{1}{1 - \frac{\partial C(1-\tau_f^*,T)/\partial(1-\tau)}{\partial e_f^*/\partial \tau}} \qquad (c)$$

Condition (c) can only be satisfied for $\tau_f^* \to 1$. This suggests that the optimal level of contractual precision when contracting with a for-profit agency is close to zero. This extreme result, however, rests on one crucial assumption, namely that the *pure for-profit* market is *perfectly* competitive, so that the bidder derives zero profits in equilibrium.

In sum, government may benefit from choosing TOR precision more strategically, i.e., in a way that is likely to enhance its anticipated utility from contracting out aid. Two possible sets of policy directions readily present themselves based on the ease with which government can predict which type(s) of contractor will compete. First, if procurement agents can readily predict who will compete for a certain aid service contract with high confidence, then they may well benefit from setting TOR precision according to the following rule: If they anticipate that only for-profits will compete for a specific project, then they may gain from setting TOR precision as a function of the relative benefits of providing incentives and minimizing renegotiation risks. If they anticipate that only nonprofits will make offers with $\delta_n = g$, then the optimal level of TOR precision is such that the marginal cost of making the TOR more precise equals $(\mu_g - \mu_n)$. Finally, if they expect only nonprofits to compete with $\delta_n = n$, then they may their best strategy may well be to expend no costly efforts to raise TOR precision.

Second, if procurement agents cannot anticipate the type(s) of agents most likely to compete for a given aid service contract, then it is much more ambiguous what the optimal level of TOR precision might be. Instead, government may potentially benefit from imposing a restriction on the type of agent eligible to compete. Limiting auction entry would allow procurement agents to again pick the cost-effective level of TOR precision. To judge whether such a measure is warranted, procurement agents must also consider the size of potential efficiency losses due to say a reduction in competition intensity.[32]

[32]Indeed, economists typically advocate the (resource allocative) efficiency potential of competitive markets (see e.g. Schumpeter, 1934). To counter such efficiency losses, the procurement agent may seek to simultaneously intensify competition say by staging workshops to help candidate contractors tender for contracts or by offering financial support to help cover the cost of preparing a bid.

**Appendix B: Data Appendix**

The data used in this paper comes from a unique dataset gathered by myself with the help of DFID's Procurement Department. I constructed a sample frame of competitively procured aid contracts let by the UK's Department for International Development. Specifically, I started with a list of *all* the competitively procured and fully completed projects, chronologically ranked according to the date of initiation (that is, the date when the initial contract was signed). Moving down this list (which has the most recently initiated and completed contracts at the top), I selected every contract until the targeted sample size of about 450 was reached.

The fact that all contracts included in my sample had to be completed was a requirement by DFID because of confidentiality concerns. Consequently, of all contracts initiated after 2002, those of shorter duration are over-represented. Overall, contracts of longer duration are thus likely to be under-represented in my sample. However, to the extent that those longer term projects are disproportionately implemented by for-profits, this artifact of the selection process, if anything, strengthens my main results –for instance, it implies that my estimate of the differential in cost overruns between nonprofits and for-profits, if anything, is in fact even higher.

I collated data from four different data sources:

Data on **tenders and DFID's tender assessments** come from DFID's paper archives. I manually copied the names of each contender, details about the price offers made, the specific evaluation criteria and the weights assigned to each dimension, and the scores each bid received (if available). Though the actual scoring rule used is standard -simply the weighted average of the scores for each of the dimensions- the actual weights and the criteria used varied from contract to contract. I was able to find the details about the evaluation criteria and weights used for most of the contracts in our sample (roughly for 80% of the cases). Unfortunately, the project files were much less complete about the actual scores that each candidate received. For each dimension, the weights and actual scores are expressed in percentage terms (i.e., lie between 0 and 100).

**Contract finance variables** are from DFID's own computerized information system. The variable descriptions are as follows:

1. Contract duration is the total number of days between the date of project activation and project completion.

2. Extra days input equals the number of extra person days input that was needed to complete the project. It is the difference between final and initially agreed person

days input.

3. Price of the winning bid is the total price offer, expressed in Pounds Sterling, made by the supplier who won the contract. We use this as a measure of project size.

4. Initially agreed total payments is the financial limit, expressed in Pounds Sterling, set in the initial contract.

5. Final total payments is the total sum of transfers, expressed in Pounds Sterling, made throughout project implementation (computed upon project completion).

6. Total cost overruns wrt to fees (project expenses) as a share of the initially agreed fees (project expenses) is the ratio of the overrun for personnel fees (project expenses) over initially agreed total payment for personnel fees. The overrun for personnel fees (project expenses) only is the discrepancy between final and initially agreed personnel fees (project expenses). According to DFID's procurement regulations, total payments must be broken down in the two components, personnel fees and project expenses.

**Project-specific data** are also from DFID's own computerized information system. Overall, there are 7 and 9 potential categories for, respectively, a project's discipline and sector type. Specifically, the 7 discipline types listed in declining order of frequency/popularity are: Miscellaneous; Management teams; Appraisal and monitoring; Other studies; Project coordination; Training and Feasibility Study. The 9 sector type categories are, listed from most to least frequent in the data set: Financial and business services; Health population and social development; Renewable natural resources; Commerce and tourism; Education; Construction; Energy and Extractive Industries. The social services dummy takes a value one when the project's sector type is Education, Renewable natural resources, or Health, population and social development.

**Legal status data** is drawn from resources on the internet, as of October 2004. "Nonprofit" is a dummy variable which equals one for a nonprofit contractor.

**TOR-specific data** come from two independent judges who rated each project's TOR on a scale from 1 to 5 along six, distinct dimensions: complexity, precision, monitoring and evaluation provisos, leadership, labour input and public goods nature. Appendix: Table1 shows the framework that the judges used when rating each TOR. I estimated the interrater reliability using three distinct approaches (Stemler, 2004): I computed a *consensus* estimate of 85% (allowing the two judges to differ by no more than one point on the rating scale). For each of the categories (complexity, precision, etc.), I also computed the Spearman rank correlation and Cronberg alpha's coefficients to evaluate whether each

judge applied the rating scale consistently. The estimates suggest a fair amount of intra-rater *consistency.* Finally, I computed a *measurement* estimate of interrater reliability using principal components analysis for each category: The percentage of variance explainable by the first principal component was always high (70% and above), which gives some indication that the judges are rating a common construct. Based on these results, I use the average scores from the two judges throughout the analysis.

**Herfindahl Indices (HI):** I computed two types of Herfindahl indices. Herfindahl Index 1 for auction category $j$ equals the sum of the squared market shares of all the firms in market $j$. Herfindahl Index 2 for auction category $j$ equals the sum of squared contract shares of all the firms in market $j$.

### Appendix C: Details about DFID's Contracting Process

As with most procurement in the public sector, value for money is the core principle underlying DFID's procurement, and is enhanced -so the rhetoric goes- by encouraging competition through appropriately competitive and nondiscriminatory procurement processes. To ensure consistency of application of procurement principles across departments and offices, DFID has established mandatory procedures for procurements depending on the value and nature of the services being purchased.[33]

Appendix: Figure 1 schematically depicts the initial steps in DFID's contracting process. To get a flavour of the mechanics underlying DFID's procurement instructions, consider the following example. A member of DFID's staff based in Russia wishes to contract-out the coordination of a project on revitalizating insolvent farms. Suppose the services are worth over £93,738. Initially, he/she must work out a contracting strategy, including contract duration and whether he/she wishes to use a fixed-price or cost-reimbursable contract.[34] Then, he/she must fill out an Authority to Engage form. Herewith, she provides DFID's Procurement Department (henceforth, PrD) details about the services, final TOR, estimated total value of the contract, criteria for the PrD to use to perform an initial sift through the expressions of interest if needed, and tender assessment criteria. Once project or programme approval is obtained, the consultancy opportunity is announced on DFID's website and advertised in the Official Journal of the European Union (OJEU). Henceforth, all correspondence with potential bidders is routed thought the PrD, who ensures all bidders receive the same information. The timescale from publishing a notice to deadline for tenders can be relatively short - however, for an open procedure (i.e.,

[33] A distinct set of guidelines apply to the procurement of *goods.* Discussion of these guidelines, however, falls outside the remit of this paper as this study is centered on understanding the contractual environment for the delivery of aid *services.*

[34] Fixed-price contracts for aid services are hardly ever used.

where any elegible organization can compete), DFID must allow at least 52 days between sending the contract to OJEU and deadline for tenders. Finally, a team of professional advisors (usually members of DFID's staff, including the person based in Russia who initiated the contracting process) carries out bid evaluation within two weeks of bids being returned in accordance with the initially defined tender assessment criteria, and tells the PrD how all the bidders were evaluated. In the vast majority of cases, the final contract stipulates a fixed set of contractual terms and conditions, and a financial limit. Once contracts are signed, the consultant can kick-off the project.

DFID's procurement practices have acquired two new elements in recent years. There is a new focus on devolution of procurement management. A rising number of staff in DFID's overeas offices is receiving intensive training to manage the contracting process locally. Trained local contracts officers are authorized to arrange the contracting procedure on their own, provided that the services are worth less than £93,739. Also, as DFID increases its spending on Budget Support[35], it is challenged to meet growing need for instruments that help excell procurement management.

### Appendix D: Auxiliary Implication of the Theory

Appendix Table 2 investigates a further prediction of the model. The theoretical arguments predict that nonprofits and for-profits will tend to make different initial bids. One implication of Proposition 4 is that if both firm types compete, then the winner is on average less likely to have made the cheapest offer compared to when only one firm type competes.[36]

To test this prediction empirically, I estimate the following probit model for each contract $i$ awarded through auction type $j$:

$$\Pr ob(C_{ij} = 1) = \alpha + \beta \cdot I(j = 2) + \gamma n_i + \mathbf{x}_i'\psi + \varepsilon_{ij}$$

where $C_{ij}$ is a dummy variable for when the winner/contractor was also the cheapest bidder, $I(j = 2)$ is a dummy variable for when the auction is mixed, $n_i$ is the number of competitors, $\mathbf{x}_i$ is a vector whose elements include contract size, discipline and sector-

[35] Budget Support is a form of programmatic aid in which funds are provided in support of a government programme that focuses on growth and poverty reduction, and transforming institutions, especially budgetary. These funds are provided to a partner government to spend using its own financial management and accountability systems.

[36] To see why this must be the case, suppose that condition (4) holds with equality, the buyer is thus indifferent between the two bids, and hence randomly accepts one. Then, if $\tau\left(\theta_{gg} - \mu_g\right) \leq (>)(1 - \tau)b(e_f) - b(e_n)$, then $T_n \leq (>)T_f$. Similarly, suppose that condition (5) holds with equality, and both agent types compete. Then, if $\tau\theta_{gg} - \mu_g \leq (>)(1-\tau)b(e_f) - b(e_n)$, then $T_n \leq (>)T_f$. These results imply that for the mixed auctions, it is comparatively less likely that the winning bid is also the cheapest bid.

specific dummies and $\varepsilon_{ij}$ is the project level error term. The coefficient of primary interest is $\beta$.

Appendix: Table 2 reports the results. We find that irrespective of the number of competitors, the winner in mixed auctions is nearly thirty percentage points less likely to have offered the cheapest price bid relative to the winner in pure auctions holding the other variables constant.

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# Chapter 3

# Collective Grant Contracts

## 3.1 Introduction

Over the past few years, markets for grant finance have proliferated and become increasingly *thick,* with an ever larger number of potential grant recipients interacting with a growing number of grant-making institutions, notably foundations and philanthropists.[1] Despite this, remarkably few, practical mechanisms have at the same time evolved to help grant-making institutions overcome both the *congestion* that thickness can bring and the inherent *screening difficulties* that thickness can aggravate. These markets are virtually all organized via competitive calls for *individual* project proposals. The Ford Foundation, as an example, ranked amongst the top 5 U.S. foundations by giving, each year reviews about 44,000 individual project proposals, of which no more than 5% receive support. The central issue in such markets is twofold: the bottlenecks slow down the speed with which potential grant recipients and grant-making organizations can interact. When grant-seekers or grant-makers are faced with this congestion, they may react in ways that damage other properties of the market, e.g. if they try to gain time and effectuate a transaction before a call for proposals has been publicly announced. And, the bottlenecks impart extra pressure on the screening devices currently used by grant-makers. A grant-making institution has a difficult time distinguishing between inherently

[1] The total number of US grant-making foundations alone nearly tripled since 1985, and their combined assets rose from $102.06 billion to $550.6 billion. Estimated giving by US grant-making foundations reached a record high of $36.4 billion in 2005 –nearly 6 times as much as in 1985 (Foundation Centre, 2007). Philanthropy thrived not alone in the US, but worldwide. Charitable giving in 2006 amounted to no less than $285 billion globally. Concurrently, the nonprofit sector has likewise expanded in recent decades. Between 1989 and 2000, the number of organizations in the US registered as 501(c)(3) organizations increased by over 75% to 819,000 (Boris and Steuerle, 2006). At the current pace of growth, 11 new foundations and 119 nonprofits are created every day in the US.

"good" and "bad" grantees in its pool of grant applicants; if it could, the grant-maker would promise a relatively small up-front payment to the applicant with a bad project and a relatively bigger up-front transfer to the one with a good project. With growing numbers of proposals to sift through, the use of transparent methods (like scoring rules) to evaluate individual proposals also becomes a lot costlier. In this chapter, I will argue that the way markets for grant finance are organized significantly affects market outcomes, and we will show how small changes in the design of the grant contracting rules can have substantial consequences.

I study a new grant contracting method, a so-called *collective grant contracting mechanism*, that departs from the *status quo* grant-making practices in two material ways. The new method requires candidate grantees to form a group of a prespecified size and submit one collective grant proposal, pooling together individual requests. The collective grant contract specifies a series of distinct and critical individual achievements, i.e. significant stages in each project's development process, and conditions an individual's future stage grant payments not only on prior defined individual results but also on the achievements of the other group partners. Assuming that grant applicants have some information about each other's project (whereas the grant-maker has no such information), I show that this joint liability transfer will induce positive assortative matching, and raise the average quality of the organizations or projects who apply. The collective grant contracting can be viewed as a simple mechanism that exploits 'local information' to alleviate grant market failures caused by asymmetric information. Furthermore, I contend that the collective grant contract will significantly reduce transactions costs, that is, the administrative burden of allocating grants.

Scholars have in recent years devoted considerable attention to specialized lending institutions that use unconventional methods like group-lending to lend successfully to the poor (see e.g. Ghatak and Guinnane, 1999; Ghatak, 1999; Armendariz de Aghion and Gollier, 2000; Laffont and N'Guessan, 2000; Laffont, 2002; Armendariz de Aghion and Morduch, 2002; Sadoulet, 2005). Much can be learned from the history of these methods to improve the design of grant-making institutions. Two important contractual features of group-lending and collective grant-making are indeed the same: the existence of joint liability and the selection of group members by, respectively, borrowers and nonprofits themselves. Notice, however, grant-making is very different from money lending. Grants are never repaid, and hence the notion of collateral does not apply to the context of grants. In grant-making, a factor analogous to interest rates is arguably the value of up-front grant payment that is unconditional upon project success, whereby relatively larger up-front transfers will tend to attract lower-quality applicants. Contrary to group lending institutions, grant-making institutions are typically nonprofit entities, and therefore the

size of profits is not a meaningful measure of grant-makers' success. Thus, compared to group lending institutions, grant-making agencies not only decide different values (parameters), but also optimise a different value function.

The idea for *collective grant contracting* is also motivated by the long established example of the Coventry 'gang system' which was a contracting method for work successfully used in early British industrial history. Under this system, management at e.g. the Standard Motor Company in Coventry and several coal mines in Durham, contracted a specific amount of work to small teams of labourers, and thereby abdicated control over the production process as well as the individual wage payment to the worker-groups (see e.g. Melman, 1958; Rayton, 1972). The "collective contracts" sought e.g. to make "workers more production conscious and cooperative" (Gropius, 1968). Essentially, joint liability or responsibility for the work affected the gang formation, induced workers to influence the way other members behaved on the shopfloor, and helped management avoid costly monitoring. Around 1950, Standard Motor Company was paying the highest wages in the automobile industry and at the same time operating manufacturing plants that were, by all odds, among the most efficient in the industry (Melman, 1958). Notice that popular concerns like poor nonprofit selection and too little nonprofit coordination facing grant-making institutions today closely resemble the concerns that led to the rise of the gang system in Great Britain in the nineteen-twenties.

This chaper makes a contribution to the market design literature (see e.g. Roth, 2002; Kittsteiner and Ockenfels, 2006). I seek to bring knowledge of general economic principles to bear on a practical question of microeconomic engineering: how to design an appropriate mechanism for grant-making that alleviates problems of adverse selection. The role of theory here is in developing intuition and identifying trade-offs in design choices by isolating the adverse selection effect. This mechanism design approach does quite well. It is hoped that the present chapter will stimulate others to carry the analysis into other areas of grant-making.

No previous literature has, to my knowledge, studied the problem of grant-making under asymmetric information. The bulk of the economic literature on grant-making has focused on understanding the motives of givers (see e.g. Andreoni, 2006),[2] the impact of the tax deduction on charitable giving (see e.g. Randolph, 1995; Auten, Sieg and Clotfelter,

[2] One model of this is that the public benefits of the nonprofit or charity enter directly in the giver's utility function, that is, charity is a privately provided public good (see e.g. Warr, 1982; Roberts, 1984; and Bergstrom, Blume and Varian, 1986). However, economists have felt more comfortable assuming that, in addition to caring about the total supply of nonprofit or charity, people also experience direct private utility from the act of giving. While there are numerous models and justifications for such an assumption, they have often been gathered under the general term of warm-glow giving (see e.g. Andreoni, 1989, 1990).

2002),[3] and the crowd-out effects of government grant-making on individual giving (see e.g. Payne, 1998).[4] A recent literature attempts to understand the details of fundraising strategies that arise in competitions for private donations -that is, how *charities* choose fundraising strategies, and how *givers* respond to these choices (see e.g Andreoni, 1998; Vesterlund, 2003; Frumkin and Kim, 2000; List and Lucking-Reiley, 2002). Instead, this chapter revolves around the grant-making strategy adopted by *grant-makers* and how *nonprofits (or charities)* respond.

Finally, this chapter is also related to a literature on information problems in credit markets (see e.g. Stiglitz and Weiss, 1981; Hubbard, 1998). The possibility that hidden types give rise to socially excessive lending has been demonstrated by de Meza and Webb (1999) and Bernanke and Gertler (1990). Instead of assuming that heterogeneity concerns risk, as in Stiglitz and Weiss (1981), in these papers entrepreneurs differ in their instrinsic quality. Consequently, the marginal entrant is also the least profitable to the banks, so the pooling interest rate is below that rate that this entrepreneur would be charged under full information. My analysis is the first to advance a similar argument in the context of *grant-making.*

The remainder of this chapter is structured as follows. In the next section, I derive the "excessive entry" result under individual grant contracting and show that overoptimism aggravates this problem. The third section examines the alternative, collective grant contracting mechanism and emphasizes additional strengths as well as problems with its implementation. I also discuss two concrete settings where the collective grant contracting mechanism presents a particularly compelling proposition. Finally, I draw some conclusions. In the Appendix, I contrast the optimal individual contractual terms with the optimal collective contractual terms given perfect and imperfect information, respectively.

[3]Dozens of studies of this question have been undertaken. Most studies employ cross-sectional data, either from surveys about giving or form tax returns. These studies are summarized by Clotfelter (1985), Steinberg (1990), and Andreoni (2006). Prior to 1995, a consensus had formed that the income elasticity was below one, typically in the range of 0.4 to 0.8, and that the price elasticity was below -1, generally in the range -1.1 to -1.3, thus meeting the gold standard. This consensus was upset by an important study of Randolph (1995). His analysis suggests that cross-sectional studies conflate short and long run elasticities and thus mislead policy analysts.

[4]There are many studies on crowding out, and most show that crowding out is quite small, often near zero, and sometime even negative (Kingma, 1989, Okten and Weisbrod. 2000, Khanna, Posnett and Sandler, 1995, Manzoor and Straub, 2005, and Hungerman, 2005). Payne (1998), however, noted that the government officials who approve the grants are elected by the same people who make donations to charities. Hence, positive feelings toward a charity will be represented in the preferences of both givers and the government. This positive relation between public and private donations means that some of the prior estimates could be biased against finding crowding out.

## 3.2 The Basic Model of an Individual Grant Contract

In this section, I identify the information effect that leads to too many individual grant requests in a simple, stripped-down adverse selection model. Consider a collection of risk-neutral, heterogeneous nonprofits each of whom is endowed with a public good project. All projects require the same first-stage (initial) and second-stage (follow-up) outlay $c^1$ and $c^2$, respectively.[5] The benefits from nonprofit $i$'s project are the random variable $B$. All projects yield the same benefits, $B^s$ if successful (or fully implemented) or $B^f$ if failed (or terminated after the first period), with $B^s > B^f > 0$. These benefits cannot be modified, so there is no moral hazard. Nonprofits value the project's (social) benefits $B$, that is, they intrinsically care about their project's outcome. What distinguishes nonprofits is their ability to successfully complete a project, that is, their probability of success $p_i(B^s) \in [0,1]$. A nonprofit's type is unobservable to the grant-maker, however, this information *is* observable to other nonprofits.[6] If $i$ and $j$ are two grantseeking nonprofits, then if $p_i(B^s) > p_j(B^s)$, nonprofit $i$ is said to have a "better project" than nonprofit $j$.

Nonprofits have the same initial resources, $W_i = W$ for all $i$, which is entirely invested either in their project or in a safe asset.[7] $W < c^1$, so that if a project is undertaken, additional finance is required. Finance is raised through grants. The infusion of grant finance is staged (see e.g. milestone grantgiving in Frumkin, 2001). Funding for the first project phase is granted up front. Funding for the second phase of the project, however, is forthcoming only if the first phase of the project was successful. Denote the first- and second-period individual grants as, respectively, $g^{I,1}$ and $g^{I,2}$. If the nonprofit is risk-neutral, it wishes to maximize expected project benefits given by

$$E\pi_i^I = p_i(B^s)\left(B^s + g^{I,2} - c^2\right) + \left(1 - p_i(B^s)\right)B^f - c^1 + g^{I,1} - W \quad (1)$$

The nonprofit will seek grant funding to undertake the project if $E\pi_i^I \geq (1+\rho)W$, where

[5] This indeed captures the essence of how most individual grant contracts today are structured. To illustrate, consider the following excerpt from the US Department of Education Discretionary Grant Programs' regulation: "Program staff use the information in the performance report in combination with the project's fiscal and management performance data to determine subsequent funding decisions. The annual performance report should also specify any changes that need to be made to the project for the upcoming funding period. A grantee cannot get a continuation award if it hasn't filed all the reports required for the grant. Before a continuation award can be issued, program staff review the information in the performance report and the grant's financial and project management activities to determine if a grantee has made substantial progress in reaching the project's objectives and that expenditures correspond to the project's plans and timelines. If these requirements are met, program staff issue a continuation award."

[6] This asymmetry of information is a key assumption, which the collective grant-making mechanism effectively exploits.

[7] The safe asset can also be interpreted as a safe 'project', a project that has already been tested and developed and where roll-out requires few additional resources beyond a fixed cost investment.

$\rho$ is the safe rate of interest. From (1) it follows that the magnitude of

$$E\pi_i^I - (1+\rho)W \geq 0 \quad (2)$$

will be smaller, the smaller the value of $p_i(B^s)$. From (2), there is a cut-off success probability below which grants are not requested. Call this threshold value or success rate of the marginal applicant, found by solving (2) with equality,

$$p_i^* = \frac{(2+\rho)W + c^1 - g^{C,1} - B^f}{(B^s - B^f + g^{C,2} - c^2)}. \quad (3)$$

I find that the success rate of the marginal applicant $p_i^*$ increases with the first- and second-stage project costs $c^1$ and $c^2$, the amount of own funds invested $W$, and decreases with the first- and second-stage funding $g^{I,1}$ and $g^{I,2}$, $B^f$ and the difference between $B^s$ and $B^f$, that is, the difference in expected returns between a project that succeeds and one that fails.

The characterization of $p_i^*$ (Equation 3) reveals several additional possible mechanisms that can deal with asymmetric information about applicant quality. Though considered to be fixed and exogenous in my exposition, in reality grant-making institutions often do impose a minimum level of own finance, $W$. Evidently, the larger the share of initial costs borne by the nonprofit, the higher the quality of the marginal applicant. This seems to be an important mechanism (see e.g. the requirement to match the grant funding).[8] Also, grant-making institutions often prefer to delay grant payment until intermediary performance has been evaluated favourably. This means promising a smaller up-front payment $g^{I,1}$, and, as can be seen here, essentially causing an upwards shift in the threshold value $p_i^*$. Again, this seems to be an important screening mechanism in practice, at times even taken to the extreme with $g^{C,1}$ close to zero.[9]

Denote the average success probability of the grant applicants $\overline{p}$, so $\overline{p} > p_i^*$ and $\overline{p}\left(B^s - B^f + g^{I,2}\right) > p_i^*\left(B^s - B^f + g^{I,2}\right)$. The marginal grant applicant is indifferent to entry but generates an expected loss of $(\overline{p} - p_i^*)\left(B^s - B^f + g^{I,2}\right)$. Under public information, second-period funding would be tailored to the nonprofit's type, so the marginal grantee under public information would now face a lower second period grant and they would not apply for a grant. The marginal grantees expelled from the market have projects with expected net benefits $(\overline{p} - p_i^*)\left(B^s - B^f + g^{I,2}\right)$ below the opportunity cost of the funds used. It is in this sense that the market equilibrium is characterized by excessive

[8] Many European Funding Programmes require grant recipients to match the grant with resources from elsewhere. The European Structural Funds, for example, meet a proportion of the cost of any project: the remainder has to be found from national resources.

[9] Note setting $g^{C,1}$ close to zero will only be feasible when the nonprofit sufficiently values the project's returns even when it has failed, $B^f$.

grant applying.

If applicants are prone to overoptimism, the problem is exacerbated. Suppose that the true probabilities of success are given by $p$ but are believed by the nonprofits to be higher. Then, for any given $(g^{I,1}, g^{I,2})$, the marginal applicant will be of even lower quality than under realism and hence $\overline{p}$ will also be lower. Overoptimism thus results in even more entry and lower average grant applicant quality.

## 3.3 The Collective Grant Contract: An Alternative Mechanism

In this section, I examine one possible new mechanism through which grant-making foundations can improve efficiency based on the self-selection of grant applicant groups.and the effect on the pool of grant applicants. A collective grant contract involves asking applicants (nonprofits) to form groups of a certain size, and stipulating a future 'joint liability' transfer. As in individual milestone grants, if a grantee's project fails in the first stage, then she receives no second stage grant funding. But if a grantee's project is successful in the first stage, then second stage funding is granted only when the projects of her partners were likewise successful in the first stage. Thus, unlike individual grant contracts, second-stage, or more generally future grant infusions are contingent on the project success of a pre-specified set of other nonprofits.

### 3.3.1 Equilibrium in the Group Formation Game

First I show that for any given collective grant contract $(g^{C,1}, g^{C,2})$, grant applicants will always choose partners of the same type.[10] That is, the equilibrium in the group formation game will satisfy the optimal sorting property, namely nonprofits not in the same group could not form a group without making at least one of them worse off. I thus establish the following important property of collective grant contracts:

**Proposition 3.1** *Collective grant contracts will lead to positive assortative matching in the formation of groups.*

[10] Recall, types are readily observable to fellow grant applicants. That is, I assume that grant applicants have some information about the likelihood of success of each other's projects that the grant-maker notably hasn't got.

Proof: The expected payoff of a nonprofit of type $i$ when her partner is type $j$ from a collective grant contract is:

$$E\pi_{ij}^{C} \equiv p_i(B^s)p_j(B^s)\left(B^s + g^{C,2} - c^2\right) + \left(1 - p_i(B^s)p_j(B^s)\right)B^f - c^1 + g^{C,1} - W \quad (4)$$

The difference in the expected payoff of a nonprofit of type $p_i(B^s)$ of having a partner who has probabilty of success $p_j(B^s)$ instead of $p_k(B^s)$ is

$$E\pi_{ij}^{C} - E\pi_{ik}^{C} = p_i(B^s)\left[p_j^{'}(B^s) - p_k^{''}(B^s)\right]\left(B^s - B^f + g^{C,2} - c^2\right) \quad (5)$$

Suppose $p_j^{'}(B^s) > p_k^{''}(B^s)$. In choosing between two potential partners with different probabilities of success $p_j^{'}(B^s)$ and $p_k^{''}(B^s)$, any applicant will be willing to pay a strictly positive amount to have the partner whose probability of success is $p_j^{'}(B^s)$. But the maximum amount a nonprofit of type $p_i(B^s)$ is willing to pay to have a partner of type $p_j^{'}(B^s)$ over $p_k^{''}(B^s)$ is increasing in her own probability of success.■

The intuition is as follows: because nonprofits with a higher success probability place the highest value on having a partner with a high probability of success, they bid the most for these nonprofits. As a result, grant applicants of the same ability are matched together, just as partners of similar quality are matched together in Becker's model of marriage markets or in Ghatak's model of group lending (Becker, 1973; Ghatak, 1999). The underlying force driving the positive assortative matching result is also similar in these models: the types of agents are complementary in their (expected) payoff functions. Finally, the positive assortative matching result is distribution free, that is, the type distribution will affect the equilibrium payoffs, but there will always be positive assortative matching regardless of the distribution of types.[11]

### 3.3.2 Average Quality of the Applicants

In the previous subsection I established that faced with any collective grant contract $(g^{C,1}, g^{C,2})$ nonprofits will choose partners of the same type. Here I derive the success probability of the marginal grant applicant (that is, the applicant who is indifferent to entry). Suppose a grant-making foundation offers a finite set of collective grant contracts. Nonprofits who wish to apply for any one of these grants $(g^{C,1}, g^{C,2})$ select a partner and submit a grant request. The success rate of the marginal grant applicant $i$ is

$$p_i^{**} = \frac{(2+\rho)W + c^1 - g^{C,1} - B^f}{p_j(B^s)\left(B^s - B^f + g^{C,2} - c^2\right)}. \quad (6)$$

[11] This implies that the degree of joint liability can be used as a screening instrument to induce grantseekers to self select grants that differ in terms of individual and joint liability.

Hence, we have:

**Proposition 3.2** *The average quality of the grant applicants is ceteris paribus higher with collective grant contracts than with individual grant contracts.*

Proof: Since $p_j(B^s) \in (0,1)$, $p_i^{**} > p_i^*$.■

Thus, the success and efficiency of grant contracts are higher under collective grant contracts as compared to individual grant contracts because the former exploit a useful resource that the latter do not: the information nonprofits have about each other.

## 3.4 Discussion

The previous two sections made explicit the argument that hidden types may be associated with excessive individual grant requesting, and demonstrated how a collective contracting mechanism can essentially alleviate grant market failures due to adverse selection. In this section, I draw out several additional strengths that a collective contracting mechanism can produce. I also emphasize practical problems that can arise in its implementations, and finally elaborate on two concrete grant contracting settings, where experimentation with a collective grant contracting mechanism seems particulary compelling.

### 3.4.1 Additional Benefits with Collective Grant Contracts

**Peer Pressure and Mutual Assistance Ex Post**

It is a common worry that by pitting nonprofits in competition with other nonprofits, the grant-making process will destroy networks of mutuality and their contributions to social welfare (Goodin, 2003). Collective grant contracts presents a way for grant-makers to reconcile competitive pressures with incentives to collaborate, enabling grant-makers to capture efficiency gains from both competition *ex ante* (between nonprofits for limited grant finance) and mutual assistance *ex post* (amongst nonprofits in a same group). While the other group members are not forced explicitly to help each other in hard times, they have an incentive to do so if they wish to continue receiving future grant transfers. Furthermore, the joint liability component can induce grantees to put peer pressure on delinquent group members, which can in turn improves the effectiveness of grant finance.

**Transactions Costs**

Screening potential grant recipients is a costly process for a grant-making institution.

At the same time, nonprofits from the same locality or active in the same sector areas typically have some information about each other's projects. And so the collective grant contract deliberately induces grant applicants to select their group members in a way that exploits this information. Recall that the collective grant contract shifts the probability of success of the marginal applicant upwards relative to individual grant contracts. Suppose that nonprofit talent (or success likelihood) follows a normal Laplace-Gaussian distribution. Then, under the collective contract regime, the number of nonprofits who solicit grant support will be comparatively smaller. Furthermore, by contracting with groups of nonprofits instead of nonprofits individually, the collective grant contract affords a grant-making institution an extra cut in administrative costs.

**Reputation Effects**

Because of the many grant-making institutions and the fact that they seldom exchange information about their experiences with their grant recipients, there is a general worry (not specific to collective grant contracts) that reputational concerns and grant denial threats act only as weak disciplinary mechanisms. Intuitively, nothing prevents a nonprofit after a poor performance with one grant-maker to apply for grant finance elsewhere. Indeed, this is often the case. Still, under the collective grant contract, such poor performing nonprofits will find it increasingly difficult to join a group. Essentially, the collective grant contract mechanism can help to squeeze such poor performing nonprofits out of the market.

### 3.4.2 Problems with the Implementation of Collective Grant Contracts

**Social Ties**

The role that social ties play in the group formation process is *a priori* ambiguous. On the one hand, social ties can facilitate the flow of information the other nonprofits' types, that is, allow nonprofits to form accurate beliefs about each others' talent. On the other hand, social ties can also stand in the way of the actual, *effective* use of this information. This is e.g. the case when a nonprofit selects another nonprofit into her group because of friendship considerations, and not on the basis of merit or talent (that is, information about her project type). In such circumstances, social ties become an obstacle in the group formation process. Positive assortative matching of nonprofits is no longer guaranteed. Furthermore, social ties can also weaken peer pressure *ex post,* that is, if nonprofits feel discomfort or find it difficult to credibly penalize or pressurize one another to perform well.

**Search or Matching Frictions**

If nonprofits have no *ex ante* information about the other nonprofits' types, and search

costs are prohibilitively costly, then potential applicants may be forced to pair randomly. Consequently, the positive assortative matching result will then no longer prevail.

**Timing of the Projects**

With collective grant contracts, the timing of major milestones for each individual project in a group should roughly coincide. Fortunately, this is often implied by the grant-maker's focus on projects of a certain, ex ante specified size (of a certain duration and of involving a certain type of activity).

**Contract Renegotiation**

One major shortcoming of a collective grant contract is that the mechanism is, in theory, not renegotiation-proof. To illustrate, consider a situation where a collective grant contract has been awarded to a pair of nonprofits. At the end of stage 1, only one of the two nonprofits has been successful. Then, according to the initial contractual terms, the two nonprofits will not receive any additional grant finance to fund the second stage of their projects. However, the successful nonprofit and the grant-maker at that point have an incentive to renegotiate the original contract and ensure that the successful project continues. The grant-maker (principal) would wish to propose a new, Pareto-improving second-period contract to the successful nonprofit (agent) only. Anticipating this, nonprofits may then, rightly so, disregard the threat of collective punishment -that is, the threat of receiving no further grant finance when at least one of the group members 'defaults'. In practice, one way for the grant-maker to alleviate such problems (and to avoid this unravelling of joint responsibility) is to stick with the initial contractual terms, and instead encourage the successful nonprofit to submit another grant request (to finance the second project phase) but now in a different group configuration.

### 3.4.3 Two Promising Areas for the Application of Collective Grant Contracts

**International Development Grant-making**[12]

Estimated giving by U.S. foundations[13] for international purposes reached a record $3.8 billion in 2005 (Renz and Atienza, 2006). This increase represented a nearly 12 percent inflation-adjusted gain over 2002—far surpassing the 2 percent rise in overall giving in

[12] I have presented the idea of collective grant contracts at SIDA, Swedish International Development Agency. We are now exploring the possibility to pilot-test the mechanism.

[13] A grant-making foundation is a nongovernmental, nonprofit organization with its own funds (usually from a single source, either an individual, a family or a corporation) and program managed by its own trustees and directors, established to maintain or aid educational, social, charitable, religious or other activities serving the common welfare, primarily by making grants to other nonprofit organizations (Renz, 1997).

the same period. This trend is likely to persist and, perhaps, even intensify. At the same time, new, ultra-rich donors who largely drive this trend are increasingly moving to treat their grants and donations just as any other financial investment. But now, instead of maximizing the return on investment, their goal is to maximize the social return, i.e. the benefit given to receivers of the charitable services they help finance. This implies a new mindset that is now more and more also being adopted by governmental grant-makers.[14] These two trends are particularly compatible with the idea of a collective grant contracting mechanism since the mechanism strives to raise the efficiency of grant-making by e.g. improving the selection of grant recipients.

I briefly mention three additional reasons for why the context of international aid grant-making seems particularly fit to take-up collective grant contracting. Firstly, many grant-making agencies are remote from everyday *field* experiences, and hence face significant costs to learn more about the true quality of local or foreign grantseeking candidates. Secondly, there is a widely shared concern that aid development workers time and again fail to coordinate their activities, duplicating each others' services. The group selection process induced by the collective grant contracting mechanism can alleviate this problem: grantseekers have an incentive to contact each other, find out about each others' work, etc. Finally, since aid has been untied in many donor countries, demand for grant finance administered by bilateral donors has recently witnessed an explosive growth. This has *a priori* aggravated the adverse selection problem.

**Grantmaking and Supporting New Organizations**[15]

Philanthropists and grant-making institutions are widely perceived to be particularly good at supporting innovative ideas and experimenting with novel entrepreneurial responses to market failures.[16] However, there is abundant evidence that they often favour initiatives put forth by nonprofits whom they know well and with a proven track record. Evidently,

[14] In FY 2000, USAID awarded $1 billion in grants to nongovernemental organizations. Grants accounted for 25% of all USAID obligations to nongovernmental organizations.

[15] I am currently in negotiation with a major bank in Belgium to help them develop a new and practical financial service targeted at nonprofits and social entrepreneurs, which is based on the collective grant contracting mechanism. There is abundant evidence that many talented nonprofit and social entrepreneurs fail to scale-up their ventures because they are often excluded from access to capital markets, relying instead on restrictive, uncertain public funds. From a bank's point of view, two major problems with the market of loans to nonprofit and social entrepreneurs as currently designed or conceived stand out: individual transactions costs are high and risks screening is difficult. The new collective contracting mechanism, would require nonprofit and social entrepreneurs to form groups of a certain size, and would stipulate a 'joint liability' loan or financial input.

[16] Some examples: When the Scottish physician Alexander Fleming discovered that mould seemed to kill bacteria, he needed money to develop and refine the first dose of penicillin that patients could safely take. Neither his government nor private industry would give him the funds. In the late 1930s, Fleming received funding from John D. Rockefeller. Ashoka, founded by Bill Drayton, started with an annual budget of $50,000 which has now grown to nearly $30 million in 2006. Ashoka named, created and pioneered the global field of social entrepreneurship. It established programs in over 60 countries and supports the work of over 1800 Fellows.

such an 'incumbent bias,' raises entry barriers for new, innovative nonprofits. The collective grant contracting mechanism can be readily adapted to help grantmaking foundations deal with this contradiction.

For instance, a grant-maker could further mandate that at least one of the group members has never received grant funding before. This additional clause would reflect a clear commitment to invest in new ideas. In settings where competitive tendering for public sector grant finance has been compromised and the allocation of grant funds too politicized, this modification of the collective grant contracting method could instigate a positive change.

## 3.5 Conclusion

In this chapter, I have presented a new grant contracting mechanism that alleviates grant market failures due to adverse selection. The main design innovation is that under a *collective* grant contracting regime grant-making institutions contract with groups of nonprofits instead of nonprofits individually, and make future-stage grant payments conditional not only individual success but also on the intermediary achievements of fellow group partners. Collective grant contracts thus exploit a useful resource that *individual* grant contracts do not, namely the information nonprofits have about each other. They also induce nonprofits in a same group to help each other in difficult times, and lower the transactions costs of contracting. Still, in certain circumstances, the collective grant contracts will fail to fully achieve the efficiency gains based on the self-selection of grant applicant groups.and the effect on the pool of grant applicants; for instance, when social ties interfere with the positive assortative matching property of the group formation process.

The theoretical arguments in this chapter can also explain why grant-making institutions commonly delay the actual disbursement of the grant transfer, stipulate milestones, or require own-finances or match funding. Another appealing feature of the collective grant contracting mechanism is that the mechanism can easily be modified to meet additional concerns, as I illustrated with the example of grant-making for new, innovative organizations.

One related, interesting question for future research is how to adapt the collective grant contracting mechanism to a setting where nonprofits differ not only in quality but also in project payoffs. A grant-making institution could then envisageably stipulate the level of riskiness of the portfolio of nonprofit projects that it wish to 'invest in'. Another fruitful area for future research is to explore how the optimal design of a collective contracting mechanism plays out in a setting with moral hazard. A grant-making institution could

then envisageably add-on say cross-reporting requirements. I defer such analyses to future work.

**Appendix**

I study a simple, static model of grant-making under adverse selection. Consider a single, risk-neutral grant-making institution (the principal) who privately supports projects with a *public goods* character. The grant-making institution genuinely values the outcomes of the projects she funds.[17] Furthermore, to induce good performance, she stages the payment of the grant. She pays a sum $g^1$ up-front, and the rest $g^2$ upon project completion, provided a satisfactory, intermediary project outcome.

Suppose that there is a collection of risk-neutral, heterogeneous nonprofits each of whom is endowed with a public good project. All projects require the same first-stage (initial) and second-stage (follow-up) outlay $c^1$ and $c^2$, respectively. The benefits from nonprofit $i$'s project are the random variable $B$. All projects yield the same benefits, $B^s$ if successful (or fully implemented) or $B^f$ if failed (or terminated after the first period), with $B^s > B^f > 0$.[18] These benefits cannot be modified, so there is no moral hazard. Agents supply labour to the project inelastically. Nonprofits value the project benefits $B$, that is, they intrinsically care about their project's outcome. What distinguishes nonprofits is their ability to successfully complete a project, that is, their probability of success $p_i(B^s) \in \{L, H\}$. To simplify the analysis, I thus make the type space discrete rather than continuous.[19] A nonprofit's type is private information. If $i$ and $j$ are two grantseeking nonprofits, then if $p_i(B^s) > p_j(B^s)$, nonprofit $i$ is said to have a "better project" than nonprofit $j$. Nonprofits have the same initial resources, $W_i = W$ for all $i$, which is entirely invested either in their project or in a safe asset at interest rate $\rho$. $W < c^1$, so that if a project is undertaken, additional finance is required. And so, finance is raised through grants.

Let us derive the optimal contractual terms under *individual grant contracting*. To begin with, suppose that the grant-maker is perfectly informed about the nonprofit's characteristics. The grant-maker can then treat each type of nonprofit separately and offer her a type-specific individual contract, that is $(g_i^{I,1}, g_i^{I,2})$. The grant-maker will try to maximize her payoff subject to inducing the nonprofit to accept the proposed individual contract.

[17] To keep the model tractable and simple, we do not include a "warm-glow" component in the principal's utility function. Provided the utility from the act of giving is the same under individual and collective grant-making, none of our main insights would change if we had included "warm glow" utility.

[18] Suppose there were two types of projects: high-risk high-payoff and low-risk low-payoff projects. How would this play out in the current setting with asymmetric information is an interesting question though beyond the scope of this paper.

[19] In a previous version of this chapter, I considered the two-dimensional screening problem. There, nonprofits not only differ in quality but also in 'mission', that is, the way they value the social benefit of their project (Huysentruyt, 2006).

The grant-maker will solve:

$$\underset{g_i^1, g_i^2}{Max} \left[ p_i \left( B^s - g_i^2 \right) + (1 - p_i) B^f - g_i^1 \right] \quad (7a)$$

$$s.t. \quad p_i \left( B^s + g_i^2 - c^2 \right) + (1 - p_i) B^f + g_i^1 - c^1 - W \geq (1 + \rho) W \quad \forall i \in \{L, H\} \quad (7b)$$

$$g_i^1 \geq c^1 + (2 + \rho) W - (1 - p_i) B^f \quad \forall i \in \{L, H\} \quad (7c)$$

The first and second set of constraints represent, respectively, the individual-rationality and limited liability constraints of the nonprofits. The limited liability assumption implies that in the event of project failure, the nonprofit cannot be obliged to pay for any costs net of non-pecuniary project benefits. The solution to this problem will be the menu of contracts $(g_i^{*I,1}, g_i^{*I,2})$ such that (7b) and (7c) hold with equality. The menu of first-best, optimal contracts promise a type-specific up-front payment $g_i^{*I,1} = c^1 + W - (1 - p_i) B^f$ and a common second stage transfer $g^{*I,2} = c^2 - B^s$.

Intuitively, without adverse selection, the grant-maker finds it optimal to maximize total surplus and then set the grant payment so as to appropriate the full surplus and leave no rent to the nonprofits above $(1 + \rho) W$. The nonprofit with a lower probability of success (i.e., the smaller $p_i$) receives a smaller up-front grant payment and hence overall grant. Notice also that higher required own finance, $W$, must be compensated with higher up-front payment. Also, the grant-making institution can effectively exploit a nonprofit's utility from its own project's outcome (albeit in the event of failure) to lower $g_i^1$. In fact, the grant-making institution pays the nonprofit strictly less than $c^1 + c^2$ when $(B^s + B^f) > p_i B^f + (2 + \rho) W$.

If the grant-making institution cannot observe the type of the nonprofit, she will offer the same contract to everybody. Interestingly, descriptions of grant-making practices also suggest that menus of contracs are not used. Notice that the solution to the grant-maker's optimization problem must now additionally satisfy the nonprofits' incentive compatibility constraints:

$$p_i \left( B^s + g_i^2 - c^2 \right) + (1 - p_i) B^f + g_i^1 \geq p_j \left( B^s + g_j^2 - c^2 \right) + (1 - p_j) B^f + g_j^1 \quad \forall i, j \in \{L, H\}, i \neq j.$$

The unique equilibrium is a pooling equilibrium with $g^{I,2} = c^2 - B^s$ and $g^{I,1} = c^1 + (2 + \rho) W - (1 - p_H) B^f$. Now, low quality nonprofits are able to earn an informational rent.

Let us next consider the case of *collective grant contracting* whereby nonprofits are required to form groups of two. With complete information, the grant-making institution

sets her collective contracts to solve the following optimization problem:

$$\underset{g_i^1, g_i^2}{Max} \left[ p_i p_j \left( B^s - g_i^2 \right) + \left( 1 - p_i p_j \right) B^f - g_i^1 \right] \quad (8a)$$

$$s.t. \quad p_i p_j \left( B^s + g_i^2 - c^2 \right) + \left( 1 - p_i p_j \right) B^f + g_i^1 - c^1 - W \geq (1 + \rho) W \quad \forall i \in \{L, H\} \quad (8b)$$

$$g_i^1 \geq c^1 + (2 + \rho) W - \left( 1 - p_i p_j \right) B^f \quad \forall i \in \{L, H\} \quad (8c)$$

Recall that now the second-stage grant transfer is only forthcoming when *both* nonprofits succeed. The grant-making institution can treat each pair of applicants $(i, j)$ separately. The grant-maker will offer a menu of first-best collective contracts $(g_{ij}^{*C,1}, g_{ij}^{*C,2})$ with once again, a pair-specific up-front payment $g_{ij}^1 = c^1 + (2 + \rho) W - \left( 1 - p_i p_j \right) B^f$ and common fixed, second stage transfer $g^2 = c^2 - B^s$. The higher the talent of a nonprofit and his partner, the bigger the up-front grant transfer.

Finally, with incomplete information about nonprofits' types, the grant-making institution can no longer readily discriminate between the two types. She will set the collective contractual terms as follows: $g^{C,1} = c^1 + (2 + \rho) W - \left( 1 - p_H^2 \right) B^f$ and $g^{C,2} = c^2 - B^s$. A comparison between individual and collective grant transfers readily shows that the collective grant transfers are smaller. This suggests that not only will the collective contracts increase the average quality of applicants, they also allow grant-making institutions to lower the overall size of the grant.

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# Figures and Tables

## Chapter 1

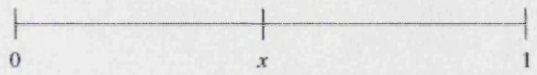



Fig. 1. The linear city.

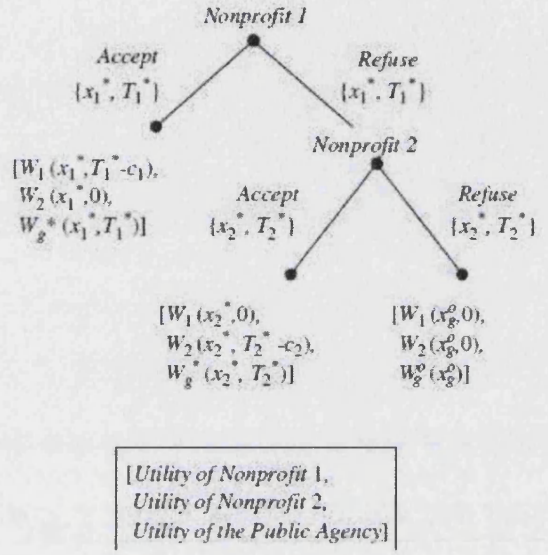



Fig. 2. Contractual game in extensive form.

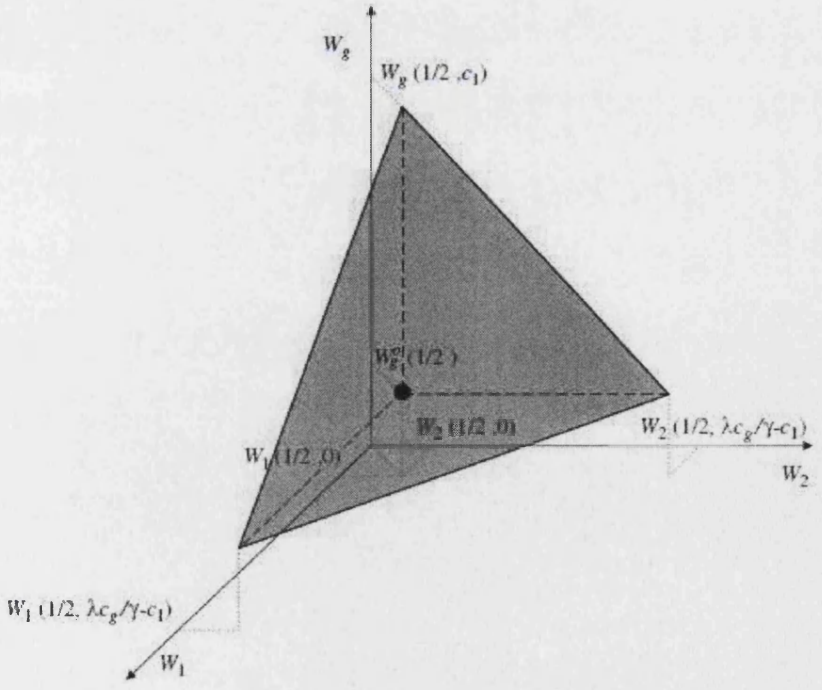



Fig. 3. Pareto frontier.

**TABLE 1**
IDENTITIES OF THE TOP 25 ENTERPRISES

| Firm ID | Enterprise Name | Initially Agreed Payments | Market Share | Nonprofit |
|---|---|---|---|---|
| 179 | PricewaterhouseCoopers | £11,062,533 | 8.51% | 0 |
| 40 | Crown Agents for Overseas Governments and Administration LTD | £7,616,208 | 5.86% | 0 |
| 6 | Agricultural Development and Advisory Services | £6,445,024 | 4.96% | 0 |
| 123 | KPMG | £5,910,667 | 4.55% | 0 |
| 20 | British Council | £4,173,592 | 3.21% | 1 |
| 60 | Enterplan International LTD | £4,160,390 | 3.20% | 0 |
| 29 | Centre for International Development and Training | £3,922,196 | 3.02% | 1 |
| 62 | Environmental Resources Management LTD | £3,522,865 | 2.71% | 0 |
| 107 | International Mining Consultants | £3,120,171 | 2.40% | 0 |
| 171 | Oxford Policy Management LTD | £2,998,864 | 2.31% | 0 |
| 137 | Maxwell Stamp Associates PLC | £2,613,533 | 2.01% | 0 |
| 15 | Bannock Consulting | £2,592,771 | 1.99% | 0 |
| 3 | Adam Smith Institute | £2,496,315 | 1.92% | 1 |
| 89 | HLSP Consulting LTD | £2,029,027 | 1.56% | 0 |
| 181 | Public Administration International | £1,824,785 | 1.40% | 0 |
| 188 | School of Public Policy (University of Birmingham) | £1,690,024 | 1.30% | 1 |
| 135 | Marine Resources Assessment Group | £1,681,082 | 1.29% | 0 |
| 74 | Futures Group Europe LTD | £1,663,306 | 1.28% | 0 |
| 90 | HTS Consultants (Formerly Hunting Technical Services LTD) | £1,559,970 | 1.20% | 0 |
| 167 | Options Consultancy Services LTD | £1,496,232 | 1.15% | 0 |
| 97 | Institute for Health Sector Development | £1,446,781 | 1.11% | 0 |
| 73 | FRR LTD (Formerly – Fountain Renewable Resources Limited) | £1,432,038 | 1.10% | 0 |
| 86 | High Point Rendel | £1,421,225 | 1.09% | 0 |
| 129 | Liverpool Associates in Tropical Health | £1,359,739 | 1.05% | 1 |
| 19 | Birks Sinclair & Associates | £1,327,877 | 1.02% | 0 |
| | **TOTAL:** | **£79,567,215** | **61%** | **5** |

*Notes*: There were a total of 459 distinct enterprises bidding for the contracts in my sample. The firms listed above are the top 25 firms, ranked according to their market share, i.e. the share of total contract pounds awarded.

**TABLE 2**
BIDDING ACTIVITIES OF THE TOP 25 ENTERPRISES

| Firm ID | No. of Wins | Initially Agreed Payments | Final Total Payments | No. of Bids | Participation Rate |
|---|---|---|---|---|---|
| 179 | 24 | £11,062,533 | £20,822,252 | 57 | 4.66% |
| 40 | 12 | £7,616,208 | £10,893,687 | 39 | 3.19% |
| 6 | 2 | £6,445,024 | £7,936,061 | 2 | 0.16% |
| 123 | 18 | £5,910,667 | £7,806,498 | 45 | 3.68% |
| 20 | 11 | £4,173,592 | £4,233,689 | 25 | 2.05% |
| 60 | 7 | £4,160,390 | £4,346,405 | 11 | 0.90% |
| 29 | 1 | £3,922,196 | £3,922,196 | 3 | 0.25% |
| 62 | 10 | £3,522,865 | £4,433,777 | 15 | 1.23% |
| 107 | 6 | £3,120,171 | £4,828,675 | 12 | 0.98% |
| 171 | 21 | £2,998,864 | £4,417,897 | 35 | 2.86% |
| 137 | 6 | £2,613,533 | £3,127,432 | 19 | 1.55% |
| 15 | 13 | £2,592,771 | £5,196,664 | 33 | 2.70% |
| 3 | 8 | £2,496,315 | £3,823,132 | 22 | 1.80% |
| 89 | 3 | £2,029,027 | £2,998,446 | 9 | 0.74% |
| 181 | 6 | £1,824,785 | £3,314,869 | 13 | 1.06% |
| 188 | 3 | £1,690,024 | £1,874,135 | 4 | 0.33% |
| 135 | 1 | £1,681,082 | £1,759,351 | 1 | 0.08% |
| 74 | 1 | £1,663,306 | £2,682,727 | 2 | 0.16% |
| 90 | 2 | £1,559,970 | £1,559,450 | 19 | 1.55% |
| 167 | 4 | £1,496,232 | £1,533,567 | 7 | 0.57% |
| 97 | 3 | £1,446,781 | £1,446,756 | 5 | 0.41% |
| 73 | 1 | £1,432,038 | £2,335,081 | 3 | 0.25% |
| 86 | 4 | £1,421,225 | £2,170,994 | 4 | 0.33% |
| 129 | 4 | £1,359,739 | £1,503,923 | 6 | 0.49% |
| 19 | 5 | £1,327,877 | £3,559,609 | 11 | 0.90% |
| **TOTAL:** | **176** | **£79,567,215** | **£112,527,273** | **402** | **32.90%** |

*Notes:* Participation rate of enterprise *i* represents the share of all bids made by enterprise *i*. Together, the top 25 firms won nearly 40% of the contracts in my study; their bids accounted for 32.9% of all bids.

**TABLE 3**
SUMMARY OF PROJECT SIZE, DURATION AND COMPETITION INTENSITY BY AUCTION CATEGORY

| | Pure Nonprofit Auctions N=77 | Mixed Auctions N=164 | Pure Forprofit Auctions N=217 | Overall N=458 |
|---|---|---|---|---|
| *Panel A: Project Size and Duration* | | | | |
| Initially Agreed Final Payments | 165,456 | 350,338 | 309,697 | 295,829 |
| | (228563) | (569713) | (522047) | (501476) |
| Final Total Payments | 201,416 | 449,940 | 410,995 | 384,600 |
| | (276777) | (755641) | (678305) | (656062) |
| Total Payments Overrun | 0.257 | 0.291 | 0.358 | 0.319 |
| | (0.570) | (0.88) | (0.866) | (0.824) |
| Overrun for Personnel Fees Only | 0.223 | 0.245 | 0.286 | 0.262 |
| | (0.602) | (0.896) | (0.704) | (0.751) |
| Overrun for Expenses Only | 0.341 | 0.224 | 0.481 | 0.374 |
| | (0.960) | (1.038) | (2.374) | (1.824) |
| Duration | 612 | 685 | 596 | 626 |
| | (451) | (596) | (419) | (438) |
| Extra Days Input | 25 | 58 | 38 | 42 |
| | (69) | (247) | (134) | (203) |
| *Panel B: Measures of Competition Intensity* | | | | |
| Number of Competing Bidders | 1.427 | 3.479 | 2.647 | 2.683 |
| | (0.738) | (1.202) | (1.412) | (1.427) |
| Number of Competing Bidders when More than 1 | 2.400 | 3.479 | 3.290 | 3.302 |
| | (0.646) | (1.202) | (1.136) | (1.166) |
| Share of Distinct Contestants who Bidded only Once | 0.823 | 0.714 | 0.624 | 0.686 |
| | {N=85} | {N=238} | {N=221} | {N=459} |
| Herfindahl Index 1 (Total Initially Agreed Final Payments) | 0.075 | 0.038 | 0.047 | 0.051 |
| Herfindahl Index 2 (No. Contracts) | 0.029 | 0.020 | 0.023 | 0.023 |

*Notes:* Standard deviations of the means are shown in parentheses. The Data Appendix describes the construction and sources of the variables in detail. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. I have a total of 458 possible observations. Deviations from this are accounted for by missing data (on which, see the Data Appendix). For the share of distinct bidders who only bid once, the total number of distinct active bidders per auction category is shown in accolades under each respective share value.

**TABLE 4**

SUMMARY OF SELECTION WEIGHTS AND TOR RATINGS BY AUCTION CATEGORY

| | Pure Nonprofit Auctions N=77 | Mixed Auctions N=164 | Pure Forprofit Auctions N=217 | Overall N=458 |
|---|---|---|---|---|
| *Panel A: Weights Assigned to Evaluation Criteria* | | | | |
| Quality of Personnel | 26.6 (7.61) | 28.01 (10.24) | 29.45 (10.92) | 28.56 (10.38) [N=364] |
| Methodology | 23.43 (12.04) | 21.69 (7.58) | 22.51 (9.12) | 22.37 (9.12) [N=344] |
| Adherence to TORs/Job Description | 13.43 (5.83) | 13.00 (5.5) | 15.04 (8.46) | 14.11 (7.26) [N=284] |
| Experience of Similar Work | 17.10 (7.61) | 19.02 (8.20) | 18.27 (9.83) | 18.46 (8.94) [N=384] |
| Experience in Particular Region | 15.14 (7.77) | 14.57 (6.05) | 12.74 (5.39) | 13.75 (6.07) [N=280] |
| Procurement Management | 8.33 (4.08) | 8.08 (3.25) | 8.25 (4.06) | 8.21 (3.72) [N=39] |
| Commercial Assessment | 10.75 (2.9) | 11.43 (3.18) | 12.19 (4.32) | 11.78 (3.83) |
| *Panel B: Ratings Based on TORs/Project Descriptions* | | | | |
| Complexity | 2.06 (0.94) | 2.19 (0.91) | 2.03 (0.88) | 2.08 (0.90) [N=396] |
| Precision | 2.79 (0.79) | 2.80 (0.71) | 2.92 (0.80) | 2.86 (0.78) [N=396] |
| Public Goods Nature | 2.97 (0.88) | 2.87 (0.95) | 2.59 (0.87) | 2.73 (0.91) [N=396] |
| Leadership | 2.40 (0.93) | 2.67 (0.98) | 2.39 (0.85) | 2.48 (0.90) [N=395] |
| Monitoring and Evaluation | 2.94 (0.93) | 2.86 (0.98) | 2.88 (0.93) | 2.87 (0.95) [N=395] |
| Labour Input | 4.86 (0.31) | 4.80 (0.45) | 4.72 (0.56) | 4.77 (0.5) [N=395] |

*Notes:* Standard deviations of the means are shown in parentheses. The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. I have a total of 458 possible observations. Deviations from this are accounted for by missing data (on which, see the Data Appendix). The total number of observations for each selection weight is shown in brackets in the final column. Notably, not all six criteria were used in each auction. For instance, the procurement management record dimension was rarely used, whereas quality of personnel was used in all auctions with non-missing data.

**TABLE 5**
AUCTION ENTRY DECISIONS AND ORGANIZATIONAL FORM

| | Pure Nonprofit Versus Pure Forprofit Auctions (1) | Mixed Versus Pure Forprofit Auctions (2) | Pure Nonprofit Versus Pure Forprofit Auctions (3) | Mixed Versus Pure Forprofit Auctions (4) |
|---|---|---|---|---|
| Price of the Winning Bid | -2.29e-06 | -1.15e-07 | -2.38e-06 | -2.13e-07 |
| | [1.12e-06]** | [2.99e-07] | [1e-06]** | [3.14e-07] |
| Construction | -36.6101 | -40.5369 | -29.4888 | -34.1962 |
| | [2.255486]*** | [1.590289]*** | [2.806038]*** | [1.744462]*** |
| Energy | -40.4075 | -42.1704 | -35.18 | -36.3927 |
| | [ 1.280426]*** | [0.7870594]*** | [1.44089]*** | [0.8208402]*** |
| Extractive Industries | -39.8548 | 0.367894 | -34.0175 | 0.290859 |
| | [1.414674]*** | [1.369836] | [1.428538]*** | [1.347473] |
| Education | 3.293021 | 1.217205 | 3.140436 | 1.014984 |
| | [1.254546]** | [1.036257] | [1.44089]** | [1.087416] |
| Rating of Public Goods Component | 0.431433 | -0.11456 | 0.51967 | -0.07765 |
| | [0.2116351]** | [0.218213] | [0.2360879]** | [0.2239296] |
| Rating of the Significance of Labour Inputs | 1.078488 | 0.56172 | 1.21081 | 0.63571 |
| | [0.4901264 ]** | [0.2836394]** | [0.5255259]** | [0.3059245]** |
| Adherence Significance | -0.02156 | -0.01871 | -0.02314 | -0.01691 |
| | [0.010851]** | [0.0066789]*** | [0.0116087]** | [0.0068773]** |
| Year Effects | NO | NO | YES | YES |
| Number of Observations | 272 | | 272 | |
| Pseudo $R^2$ | 0.12 | | 0.17 | |

*Notes:* Robust standard errors adjusted for clustering by bidder are reported in brackets. The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. We have a total of 458 possible observations. Deviations from this are accounted for by missing data. The category "Pure for-profit Competitions" is the comparison group. Regressions include all discipline and sector dummies, with "Commerce (Wholesale and Retail Trade) and Tourism" and "Training", respectively, as omitted sector and discipline type – however, the table only reports the estimated coefficients of sector and discipline variables that were statistically significant for one of the two auction types. The rating variables are expressed on a scale from one to five. The price of the winning bid is in pounds sterling, and captures the monetary value of the project. The regressions also include a measure of the number of monitoring and evaluation provisos in the TOR. The estimated coefficient of this variable, however, was insignificant, and for the sake of clarity is not reported here.

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

**TABLE 6**

COMPETITION INTENSITY AND SUPPLY MARKET COMPOSITION BEFORE AND AFTER AID UNTYING

| | Bottom Quartile of All Projects | | Mid 50% of All Projects | | Top Quartile of All Projects | |
|---|---|---|---|---|---|---|
| | Before Aid Untying (N=89) | After Aid Untying (N=24) | Before Aid Untying (N=135) | After Aid Untying (N=91) | Before Aid Untying (N=99) | After Aid Untying (N=19) |
| Ratio of total number of distinct contenders over total number of contracts awarded | 1.60 | 1.96 | 1.46 | 1.60 | 1.30 | 2.50 |
| Average number of bids per auction | 2.29 | 2.33 | 2.68 | 2.73 | 3.01 | 2.85 |
| Share of nonprofit bids | 0.43 | 0.36 | 0.38 | 0.25 | 0.27 | 0.20 |

*Notes:* The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. I have a total of 458 possible observations. Deviations from this are accounted for by missing data (on which, see the Data Appendix). Contracts in the bottom and top quartile were worth, respectively, less than £58,151 and more than £363,290.

**TABLE 7**
FOR-PROFIT STRATEGY AND AID UNTYING

| | Share of for-profit bids | |
|---|---|---|
| | Before Aid Untying | After Aid Untying |
| *Sector of Project Auctioned-off* | | |
| Commerce | 0.73 | 0.82 |
| Construction | 0.96 | 1.00 |
| Renewable Resources | 0.78 | 0.77 |
| Energy | 0.87 | 1.00 |
| Transport | 0.79 | 0.91 |
| Financial and Business Services | 0.80 | 0.81 |
| Extractive Industries | 0.86 | 0.50 |
| Health, Population and Development | 0.60 | 0.72 |
| Education | 0.44 | 0.50 |

*Notes:* Each row entry represents the share of all bids made by for-profits for projects of sector type *i* before and after aid untying.

**TABLE 8**

ADHERENCE SCORE OF THE INITIAL OFFER AND ORGANIZATIONAL FORM

| | Adherence Score in Percentage Terms | | |
|---|---|---|---|
| *Independent Variables* | (1) | (2) | (3) |
| Nonprofit | -3.49503 | -3.49503 | -3.49503 |
| | [1.94109]* | [1.94109]* | [1.94109]* |
| Rating of Public Goods Component | -5.91904 | -5.41317 | 0.105 |
| | [3.98953] | [4.23121] | [6.54011] |
| Rating of Project Complexity | 9.42668 | 8.49481 | -0.92955 |
| | [4.47322]** | [3.95855]** | [3.03913] |
| Rating of the Significance of Labour Inputs | 8.01858 | 7.8189 | 2.02031 |
| | [5.40875] | [5.37434] | [2.48543] |
| Rating of Leadership Component | -0.28666 | -0.75259 | -0.62635 |
| | [2.23661] | [1.97928] | [1.37902] |
| Rating of TOR Precision | | | -0.07479 |
| | | | [2.24423] |
| Rating of the Monitoring and Evaluation Measures specified in the TOR | | | 6.45748 |
| | | | [4.84960] |
| Weight Assigned to the Adherence Criterion | | 0.19569 | 0.16311 |
| | | [0.12227] | [0.10691] |
| Project Fixed Effects | YES | YES | YES |
| Constant | 34.65824 | 35.86967 | 46.97681 |
| | [45.67789] | [45.05015] | [12.92341]*** |
| Number of Observations | 615 | 615 | 615 |
| R-squared | 0.49 | 0.49 | 0.49 |

*Notes:* Robust standard errors are reported in brackets. The Data Appendix describes the construction and sources of the variables. The data are for all bids in auctions where adherence is used as one of the evaluation criteria. Deviations from this are accounted for by missing data. Regressions include discipline and sector dummies. The rating variables are expressed on a scale from one to five. The adherence weight variable is a number in theory between 1 and 100, but in reality, predominantly between 5 and 30.

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

**TABLE 9**

PRICE OF THE INITIAL OFFER AND ORGANIZATIONAL FORM

| | Total Costs per Day Input | Personnel Costs per Day Input | Project Expenses per Day Input |
|---|---|---|---|
| *Independent Variables* | (1) | (2) | (3) |
| Nonprofit | -76.56897<br>[30.14975]** | -74.00018<br>[17.69920]*** | -2.39066<br>[20.62979] |
| Quality of Personnel Score (%) | 3.18843<br>[2.12320] | 1.60328<br>[1.07347] | 2.18528<br>[1.66851] |
| Methodology Score (%) | -2.50255<br>[1.70112] | -2.16552<br>[0.88451]** | -0.72538<br>[1.18641] |
| Project Fixed Effects | YES | YES | YES |
| Constant | 185.11575<br>[84.57172]** | 154.9575<br>[44.03674]*** | 57.4157<br>[65.86143] |
| Observations | 311 | 310 | 310 |
| R-squared | 0.65 | 0.69 | 0.57 |

Notes: Robust standard errors are reported in brackets. The Data Appendix describes the construction and sources of the variable. The data are for all bids in mixed auctions only. I have a total of 530 possible observations, which is the overall number of bids made in mixed auctions. Deviations from this are accounted for by missing data.

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

**TABLE 10**

RENEGOTIATING COSTS AND ORGANIZATIONAL FORM

| | Total Cost Overruns wrt Fees as a Share of Initially Agreed Fees | | | Total Cost Overruns wrt Project Expenses as a Share of Initially Agreed Project Expenses | | |
|---|---|---|---|---|---|---|
| *Independent Variables* | (1) | (2) | (3) | (4) | (5) | (6) |
| Nonprofit | -0.19264<br>[0.06666]*** | -0.16478<br>[0.06716]** | -0.16662<br>[0.0676]** | -0.33171<br>[0.15624]** | -0.31189<br>[0.17227]* | -0.31804<br>[0.17385]* |
| Initially Agreed Maximal Total Transfer | -4.19e-07<br>[1.89e-07]** | -4.24e-07<br>[1.86e-07]** | -4.05e-07<br>[1.86e-07]** | -7.96e-07<br>[5.30e-07] | -8.00e-07<br>[5.26e-07] | -7.38e-07<br>[5.15e-07] |
| Ratio of Initially Agreed Maximal Project Expenses over Personnel Fees | -0.02283<br>[0.017827] | -0.01451<br>[0.01696] | -0.01597<br>[0.01686] | -0.154<br>[0.07601]* | -0.14882<br>[0.07707]* | -0.15257<br>[0.07835]* |
| Contract Duration | 0.00054<br>[0.00013]*** | 0.00056<br>[0.00014]*** | 0.00056<br>[0.00014]*** | 0.00096<br>[0.00033]*** | 0.00098<br>[0.00031]*** | 0.00095<br>[0.0003]*** |
| Social Service | | -0.12088<br>[0.07206]* | -0.12075<br>[0.07269]* | | -0.08117<br>[0.19604] | -0.06813<br>[0.1974] |
| Rating of TOR Precision | | | -0.05555<br>[0.04622] | | | -0.16819<br>[0.14029] |
| Constant | 0.11317<br>[0.04129]*** | 0.14066<br>[0.04753]*** | 0.29973<br>[0.13712]** | 0.24256<br>[0.12455]* | 0.25969<br>[0.14286]* | 0.74133<br>[0.37493]** |
| Number of Observations | 385 | 385 | 385 | 358 | 358 | 358 |
| Adj $R^2$ | 0.08 | 0.09 | 0.09 | 0.05 | 0.06 | 0.06 |

*Notes:* Robust standard errors are reported in brackets. The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. We have a total of 458 possible observations. Deviations from this are accounted for by missing data. Nonprofit is a dummy variable for when the contractor is a nonprofit or a for-profit. Initially agreed maximal total transfer is expressed in terms of Pounds Sterling. Ratio of initially agreed maximal project expenses over personnel fees captures the relative importance of project expenses. Contract duration is expressed in terms of days-inputs. Social service is a dummy variable for when the activities contracted for are in the fields of education, health, population and social development or renewable resources. Rating of the TOR precision is expressed on a scale from one (meaning 'very imprecise') to five (meaning 'very precise').

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

**TABLE 11**

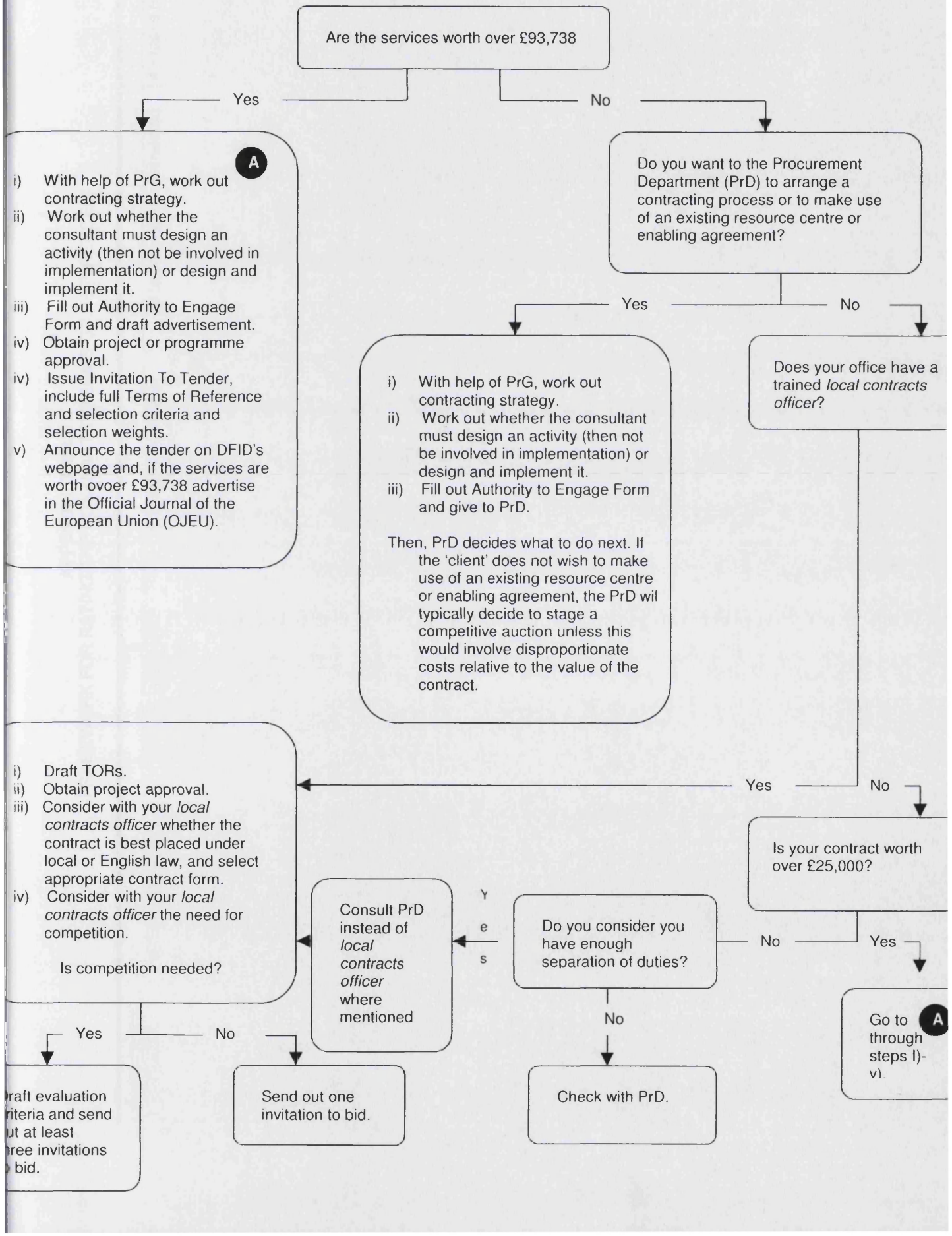
RENEGOTIATING COSTS AND ORGANIZATIONAL FORM

| | Total Cost Overruns wrt Fees as a Share of Initially Agreed Fees | | | Total Cost Overruns wrt Project Expenses as a Share of Initially Agreed Project Expenses | | |
|---|---|---|---|---|---|---|
| *Independent Variables* | (1) | (2) | (3) | (4) | (5) | (6) |
| Nonprofit | -0.27945<br>[0.14051]** | -0.29495<br>[0.14975]** | -0.29939<br>[0.12308]** | -0.37563<br>[0.16733]** | -0.36322<br>[0.19353]* | -0.34872<br>[0.18475]* |
| Initially Agreed Maximal Total Transfer | -7.21e-07<br>[3.60e-07]** | -7.14e-07<br>[3.59e-07]** | -4.93e-07<br>[2.88e-07]* | -1.99e-07<br>[4.06e-07] | -2.03e-07<br>[4.02e-07] | -1.40e-07<br>[3.80e-07] |
| Ratio of Initially Agreed Maximal Project Expenses over Personnel Fees | -0.22745<br>[0.15261] | -0.23756<br>[0.15997] | -0.10933<br>[0.12469] | -0.24262<br>[0.14775]* | -0.233<br>[0.15663] | -0.21407<br>[0.15282] |
| Contract Duration | 0.00097<br>[0.00029]*** | 0.00096<br>[0.00029]*** | 0.0007<br>[0.00024]*** | 0.00062<br>[0.00028]** | 0.00063<br>[0.00027]** | 0.00061<br>[0.00026]** |
| Social Service | | -0.05839<br>[0.15738] | -0.04524<br>[0.15166] | | -0.05303<br>[0.22162] | -0.04775<br>[0.22463] |
| Rating of TOR Precision | | | -0.08459<br>[0.08467] | | | -0.1391<br>[0.12145] |
| Constant | 0.11170<br>[0.11125] | 0.09836<br>[0.12278] | 0.39423<br>[0.25023] | 0.28049<br>[0.1213]* | 0.29352<br>[0.12740]* | 0.66503<br>[0.35459]* |
| Number of Observations | 135 | 135 | 135 | 144 | 144 | 144 |
| Adj $R^2$ | 0.08 | 0.09 | 0.09 | 0.07 | 0.07 | 0.08 |

*Notes:* Robust standard errors are reported in brackets. The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID, for *mixed auctions only*. We have a total of 164 possible observations. Deviations from this are accounted for by missing data. Nonprofit is a dummy variable for when the contractor is a nonprofit or a for-profit. Initially agreed maximal total transfer is expressed in terms of Pounds Sterling. Ratio of initially agreed maximal project expenses over personnel fees captures the relative importance of project expenses. Contract duration is expressed in terms of days-inputs. Social service is a dummy variable for when the activities contracted for are in the fields of education, health, population and social development or renewable resources. Rating of the TOR precision is expressed on a scale from one (meaning 'very imprecise') to five (meaning 'very precise').

* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.

**FIGURE 1**
OVERVIEW OF THE INITIAL STEPS IN DFID'S CONTRACTING PROCESS



**APPENDIX: TABLE 1**

FRAMEWORK FOR RATING THE CONTRACTS' "TERMS OF REFERENCES"

| *Characteristic* | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| **Complexity** | 1 skill/expertise, 1 task | 2 tasks (such as, advice+training), interrelated | 3 tasks (like advice+ research+ implementing something) all interrelated | 3 tasks not all interrelated | 4+ tasks not all interrelated |
| **Precision** | Specified in very, very vague terms, just bullet pointing some issues with no further detail | Still quite vague, but better structured (for example, by phases) and some more content to the tasks | Very comprehensive list of tasks that need to be implemented, but no details of how, or does not say specifically who to meet/contact | Well defined, very comprehensive, and states clearly what needs to be done; but also adds comments on how, process, points to focus on | Extremely detailed, both in terms of content and style/process; more specification on contents |
| **Public Goods Component** | Technical, including internal management reforms, in a sector with no clear public goods component at all (private sector) | Technical, including internal management reforms, but in a sector with some public goods element or in a sector that produces a public good directly | The services only directly affect a specific public sector agency (say, a particular Ministerial Dept), but some of the service provided have a clear public goods element | The services will impact not just a small group of professionals, but the public sector as a whole (such as, tax reforms) | The services entail the provision of pure public goods. The services achieve many spillover/externality effects. |
| **Monitoring and Evaluation** | No mention of any monitoring or evaluation arrangements. | Submit one report or a final report upon project completion. | Submit two reports, but there is no phasing (that is to say, good first report is a prerequisite to continue on to the second phase) | Submit two reports but project continuation depends on the evaluation of the first report, or submit two reports without phasing but also submit many intermediary reports | All of the previous plus specific monitoring provisions and/or specific provisions for evaluation. |
| **Leadership** | The contractor must interact with DFID staff only. | The contractor will interact with local elite (such as ministries, government depts) and possibly DFID staff | The contractor must interact with elites of the aid recipient country but also middle-rung people, or at most 2 different types of actors or DFID and 1 local (non-elite) actor. | The contractor must interact with 3 different actors or 2 local actors | The contractor must interact with 4 different types actors, including the direct beneficiaries of her services. |
| **Labour Input** | Virtually all of the services (over 90%) has to do with the procurement of materials, very little labour input - predominantly physical inputs | Physical inputs play a slightly more important role than labour input. | The services are labour intensive, but include the instalment/provision of specific infrastructure (which will continue to exist once the project is completed) | The service delivery requires mainly labour input with some use of ICT/computers | The only input that matters is people's expertise |

**APPENDIX: TABLE 2**
FURTHER IMPLICATION OF THE THEORY

| | Dependent Variable: Winner is Cheapest Bidder | |
|---|---|---|
| *Independent Variables* | (1) | (2) |
| Mixed Auction | -0.27 | -0.27696 |
| | [0.16699]* | [0.16664]* |
| Number of Competitors | -0.71467 | -0.7066 |
| | [0.06274]*** | [0.06364]*** |
| Price of the Winning Bid | | -1.51e-07 |
| | | [1.50e-07] |
| Sector and Discipline Dummies | YES | YES |
| Constant | 1.81467 | 1.81286 |
| | [0.30220]*** | [0.30023]*** |
| Number of Observations | 446 | 446 |
| Pseudo $R^2$ | 0.32 | 0.32 |

*Notes:* Robust standard errors are reported in brackets. The Data Appendix describes the construction and sources of the variables. The data are for all the contracts competitively procured between 1998 and 2003 by DFID. We have a total of 458 possible observations. Deviations from this are accounted for by missing data. Mixed auction is a dummy variable for when the auction is a mixed auction; the other two auction types (pure nonprofit and pure for-profit competitions) comprise the benchmark group. Price of the winning is expressed in Pounds Sterling, and captures the contract's size or volume.
* Significant at the 10-percent level; ** Significant at the 5-percent level; *** Significant at the 1-percent level.