MONITORING THE EFFORTS VERSUS ALIGNING THE INCENTIVES OF MANAGERS WITH THOSE OF THEIR STAKEHOLDERS

Amjad Toukan*

Abstract

I examine the case where a firm bids on a private contract. To win the award, the firm may choose to comply with a demand by the corrupt manager for a share of the value of the project to avoid being excluded from trade. My analysis shows that in countries with weak enforcement of property rights and under the prevalence of corruption, we will arrive at an equilibrium that is sub-optimal in the sense that stakeholders' welfare is not maximized. My analysis also shows that the optimal way to avoid this sub-optimality is to align managers' incentives with those of their stakeholders.

Keywords: Corruption; Private Sector Procurement; Shareholders Welfare; Contest Functions, Conflict of Interest; Corporate Governance

JEL classification: C72, D73, H57, D60, D23, D74, G34

*Lebanese American University

1 Introduction

Private sector procurement contracts generate immense opportunities for bribes, kickbacks, and other payoffs. Corrupt payments to win such contracts are generally the preserve of corporate managers. According to Rose-Ackerman (1999) there are several reasons why a firm would want to pay a bribe to a corporate manager when bidding for a large scale project. First it may induce the manager to include the firm in the short list of firms qualified to bid for the project while limiting the number of other bidding firms. Second it may be for inside information that would ultimately provide the firm with a competitive advantage. Third it may induce the manager to customize project specifications to fit firm's proposal. Fourth it may induce the corrupt manager and/or his agent to manipulate their evaluation of contract proposals in favor of the firm. Finally, once the firm wins the contract, it may pay to skimp on quality or inflate prices. In my analysis, I am examining the fourth case and I model the interaction between the corrupt manager and the firm as extortion, which according to Auriol (2004) extortion occurs when a firm complies with a demand for a share of the value of the project to avoid being excluded from trade[1].

Laffont and Tirole (1991) argue that in a multi attribute auction, the auction designer may bias his subjective evaluation of quality or distort the relative weights of the various attributes to favor a specific bidder. The paper analyzes the steps to be taken to reduce the possibility of favoritism. The authors first assume that the supervisor is benevolent and that the firm's technologies are commonly known. The principal then compares the quality differential and the cost differential between the agents. Depending on the parameters, the cost differential or the quality differential may be "decisive" in the principal's selection. The paper also relaxes the assumption that the supervisor is benevolent and does not collude with bidders. The potential for collusion stems from the agents' stake in the supervisor's report about quality. When the supervisor's information about quality is not verifiable by the principal, the principal imposes a symmetric auction even though the supervisor's information about quality would vindicate discrimination between the two bidders.

Celentani and Ganuza (2001) provide a positive theoretical analysis of the impact of competition on corruption and show that there are reasons to doubt that increasing the competitiveness of the environment is guaranteed to lead to reduced corruption. The authors consider a procurement problem and they focus their attention on a situation in which corruption is likely to prosper, i.e., a case in which the good to be procured is not homogeneous but can be produced at different quality levels and in which the agent has superior information about delivered quality. The previous assumptions imply that, in exchange for a bribe, the agent can assign the project to a firm he favors and hide the fact that it delivers lower quality

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[1] Please see Mogiljanski (1994), Konrad and Skaperdas (1997) and Leppamaki (2000)

than promised. The authors characterize equilibrium corruption and study how it depends on the degree of competitiveness of the environment. They identify the effects through which higher competition affects corruption and find that, contrary to conventional wisdom, the total effect is everything but clear cut: more competition may lead to either higher or lower corruption.

Burguet and Che (2004) study competitive procurement administered by a corrupt agent who is willing to manipulate his evaluation of contract proposals in exchange for bribes. Their results indicate that with complete information and no corruption, the efficient firm will win the contract for sure. If the agent is corrupt and has large manipulation power, however, bribery makes it costly for the efficient firm to secure a sure win, so in equilibrium the efficient firm loses the contract with positive probability. Burguet and Perry (2007) examined the effects of bribery on the behavior of suppliers and the outcome of a first-price auction. In the particular form of bribery that they have considered, one supplier bribes the auctioneer in order to revise his bid downward when this is necessary to win the contract and profitable. In particular, an inefficient allocation of the contract to the weaker dishonest supplier occurs with high probability even when the cost of the stronger honest supplier is very low.

The contribution of my paper is that it models the competition between the firm and the corrupt manager as a contest where the corrupt manager is expending costly efforts in trying to expropriate part of the value of the project and the firm is also expending costly efforts in trying to protect its profits. I incorporate the preferences of the corrupt manager and the enforcement of property rights in my model where I am able to shed some light on the impact of these two important variables on stakeholders' welfare. My results show that with complete information and no corruption, we will arrive at an equilibrium that is optimal in the sense that stakeholders' welfare is maximized. In this case the project will be awarded to the firm that provides the competitive market quality at the competitive market price. In the case of complete information and corruption, my results show that corrupt managers' preferences towards corruption in countries with weak enforcement of property rights play an essential role in determining whether we will arrive at an equilibrium that is optimal. I argue that in such countries aligning the incentives of corrupt managers with those of their stakeholders and building the national integrity system are necessary in combating corruption and arriving at an equilibrium that is optimal.

The paper is organized as follows. Section 2 outlines the model. Section 3 solves the model utilizing Tullock (1980) contest success function, examines the firm's decision to bid for the project and the corrupt manager's decision to award the project. Section 3 also analyzes the effect of a change in the efficiency of the legal system and the manager's preferences toward corruption on stakeholders' welfare. Section 4 concludes.

2 The Model

I consider a two-stage model, where in the first stage the firm is deciding whether to bid for the private project. I assume that firms are forward-looking whereby their decision to bid for the private project in stage one of the game is taken in a manner that maximizes their expected payoff in stage two where they actually perform the project. We can think of the manager as the buyer, and the firm as the seller. The manager derives utility from stakeholders' welfare as well as from the amount he can expropriate from the firm awarded the contract. We define stakeholders' welfare to equal to

$$\sum_{i=1}^{N} U_i(s_j, p_j) = (s_j - p_j)X \text{ , where } U_i(s_j, p_j) = \frac{(s_j - p_j)X}{N}$$

is the utility of stakeholder i, N is the number of stakeholders and X are the units of output per project.

The share of the gross value of the private project expropriated by the manager is a function, $q(e_m, e_s)$, depending on two kinds of effort: e_m representing costly efforts exerted by the manager to expropriate part of the gross value of the private project, and e_s representing costly efforts exerted by the bidding firm to maximize its return from performing the project. Assume, $q(e_m, e_s) \in [0,1]$,

which is increasing in e_m and decreasing in e_s, $1 - q(e_m, e_s)$ represents the share received by the firm. In the second stage of the game, the competition between the firm and the manager is modeled as a contest in which the participants exert costly efforts to increase their share of the value of the project [Clark and Riis 1997]. What is unique about this specification is that it supposes that, even when the two participants expend identical efforts, one of the two participants will enjoy a greater share of the value of the project.

$$q(e_m, e_s) = \frac{(1-\theta)f(e_m)}{(1-\theta)f(e_m) + \theta f(e_s)} \tag{1}$$

Where, $f(e_i)$ is differentiable and strictly concave with $f''(e_i) < 0$, $f'(e_i) > 0$ for every $e_i \geq 0$ and $f'(e_i) \to 0$ as $e_i \to \infty$. θ represents the efficiency of the judiciary and law enforcement system in a country and it varies between 0 and 1. An increase in θ towards 1 would indicate stronger law enforcement or a more efficient legal system which would favor the firm. Conversely a movement of θ toward 0, would indicate weaker law enforcement or a less efficient legal system. Suppose, for example, that $\theta < 1/2$, if both parties devoted an equal amount of effort to the contest, the outcome would favor the manager.

The manager wants to buy 1 unit of the project that produces X units of output and has quality s_j, where s_j is the quality per unit of output measured in dollars per unit of output. Each bidding firm is interested in selling at least one unit of the project that has quality s_j at a price per unit of output, p_j.

2.1 Second stage choice of efforts

Firms and managers choose their efforts simultaneously and in a manner that maximizes their total payoffs in stage two of the game. α is between 0 and 1 and it represents the weight that the manager places on the benefit from expropriation with $\alpha = 0$ indicating that the manager is completely benevolent. Given values of the manager's preferences, θ, the price per unit of output, p_j, the quality of the project per unit of output, s_j, and the output of the project, X, the manager chooses e_m to maximize her payoff function:

$$\underset{e_m}{Max} V_m = \alpha q(e_m, e_s) p_j X + (1-\alpha)(s_j - p_j)X - e_m \qquad 0 \leq \alpha \leq 1 \tag{2}$$

Similarly firms choose e_s to maximize their payoff function:

$$\underset{e_s}{Max} V_j = [1 - q(e_m, e_s)] p_j X - s_j X - e_s \tag{3}$$

Assuming interior optima, e_m^* and e_s^*, these solutions are defined implicitly by the respective first order conditions as functions of a, p_j, X, and s_j. Substituting the equilibrium efforts e_m^* and e_s^* into equations (1) and (2) above I get the equilibrium payoffs to the manager V_m^* and to the firm V_j^*. Because e_m^* and e_s^* are a function of a, p_j, X, and s_j, V_m^* and V_j^* are also functions of a, p_j, X, and s_j.

3 Equilibrium Choices where the Parties Compete in an Asymmetric Contest

I solve for the manager's equilibrium efforts by deriving the first-order condition from the manager's payoff function shown in equation (2) above:

$$\frac{\alpha\theta(1-\theta)f(e_s)f'(e_m)}{[(1-\theta)f(e_m) + \theta f(e_s)]^2} p_j X = 1 \tag{4}$$

In order to solve for the firm's equilibrium efforts, I derive the first-order condition of the firm's payoff function shown in equation (3) above:

$$\frac{\theta(1-\theta)f(e_m)f'(e_s)}{[(1-\theta)f(e_m) + \theta f(e_s)]^2} p_j X = 1 \tag{5}$$

Combining equations (4) and (5) above, I get:

$$f(e_m^*) = \alpha \, \frac{f^{'}(e_m^*)}{f^{'}(e_s^*)} \, f(e_s^*) \tag{6}$$

Plugging equation (6) into equations (4) and (5) above, I can solve for the manager's and the firm's equilibrium efforts as given respectively by equations (7) and (8) below:

$$e_m^* = f^{-1}\left[\frac{\alpha^2 \theta(1-\theta)f^{'}(e_s)[f^{'}(e_m)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] \tag{7}$$

$$e_s^* = f^{-1}\left[\frac{\alpha \theta(1-\theta)f^{'}(e_m)[f^{'}(e_s)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] \tag{8}$$

Substituting (7) and (8) into (2) and (3) above I get the equilibrium payoffs to the manager and to the firm respectively:

$$V_m^* = \frac{\alpha^2(1-\theta)f^{'}(e_m)}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]} \, p_j X - f^{-1}\left[\frac{\alpha^2 \theta(1-\theta)f^{'}(e_s)[f^{'}(e_m)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] + (1-\alpha)(s_j - p_j)X \tag{9}$$

$$V_s^* = \frac{\theta f^{'}(e_s)}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]} \, p_j X - f^{-1}\left[\frac{\alpha \theta(1-\theta)f^{'}(e_m)[f^{'}(e_s)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] - s_j X \tag{10}$$

3.1 Choosing the optimal quality to both the manager and the firm

We assume that the market for the project is competitive where the manager can always buy the competitive market quality per unit of output of the project, s_w, at the competitive market price per unit of output of the project, p_w. The firm can also sell the competitive quality per unit of output of the project, s_w, at the competitive market price per unit of output of the project, p_w.

Given the above assumption, the manager will choose the quality and the price of the project such that the value she receives is at least equal to the difference between the competitive market quality, s_w, and the competitive market price, p_w:

$$V_m^* \geq (s_w - p_w)X \tag{11}$$

Which implies that,

$$s_j \geq \left[\frac{s_w - p_w}{1-\alpha}\right] + \frac{\theta f^{'}(e_s)}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]} \, p_j + \frac{[1-2\alpha]\alpha(1-\theta)f^{'}(e_m)}{[1-\alpha][\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]} \, p_j$$

$$+ \frac{1}{(1-\alpha)X} \, f^{-1}\left[\frac{\alpha^2 \theta(1-\theta)f^{'}(e_s)[f^{'}(e_m)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] \tag{12}$$

or,

$$[s_j - p_j] - [s_w - p_w] + \frac{\alpha^2(1-\theta)f^{'}(e_m)}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]} \, p_j \geq \frac{1}{X} f^{-1}\left[\frac{\alpha^2 \theta(1-\theta)f^{'}(e_s)[f^{'}(e_m)]^2}{[\alpha(1-\theta)f^{'}(e_m)+\theta f^{'}(e_s)]^2} \, p_j X \right] + \alpha[s_j - p_j] \tag{13}$$

Examining inequality (13) we see that the benefit to the manager from participating in the project is equal the difference between stakeholders' welfare per unit of output of the project, $[s_j - p_j]$, and stakeholders' welfare per unit of output from buying the competitive market quality project at the competitive market price, $[s_w - p_w]$, plus the gain per unit of output from expropriating part of the value of the project,

$$\frac{\alpha^2 (1-\theta) f'(e_m)}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]} p_j .$$

The cost to the manager from participating in the project is equal to the effort per unit of output that she exerts in expropriating part of the value of the project,

$$\frac{1}{X} f^{-1} \left[\frac{\alpha^2 \theta (1-\theta) f'(e_s)[f'(e_m)]^2}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]^2} p_j X \right]$$

$$s_j \leq [s_w - p_w] + \frac{\theta f'(e_s)}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]} p_j - \frac{1}{X} f^{-1} \left[\frac{\alpha \theta (1-\theta) f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]^2} p_j X \right] \quad (15)$$

or

$$[p_j - s_j] - [p_w - s_w] \geq \frac{\alpha(1-\theta) f'(e_m)}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]} p_j + \frac{1}{X} f^{-1} \left[\frac{\alpha \theta (1-\theta) f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]^2} p_j X \right] \quad (16)$$

Examining inequality (16) we see that the benefit to the firm is equal the difference between the profit per unit of output of the project, $[p_j - s_j]$, and the profit per unit of output from selling the competitive market quality project at the competitive market price, $[p_w - s_w]$. The cost to the firm is equal to the value of the project per unit of output expropriated by the manager, $\frac{\alpha(1-\theta) f'(e_m)}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]} p_j$, plus the effort per unit of output exerted by the firm to protect its profit from performing the project,

$$\frac{1}{X} f^{-1} \left[\frac{\alpha \theta (1-\theta) f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta) f'(e_m) + \theta f'(e_s)]^2} p_j X \right] .$$

Inequality (16) represents the participation constraint for the firm. The firm will submit a bid for the project as long as the benefit from participation is at least equal to the cost of participation.

I examine two possible cases below:

plus the loss in stakeholders' welfare due to the manager's preferences for expropriation, $\alpha[s_j - p_j]$. Inequality (13) represents the participation constraint for the manager. The manager will recommend the project as long as the benefit from participation is at least equal to the cost of participation.

The firm cares about maximizing profit and it will choose the price and the quality of the project such that the value it receives is at least equal to the value it receives if it sold the project in the market at the competitive market price per unit of output, p_w, and provided the competitive market quality per unit of output, s_w:

$$V_s^* \geq (p_w - s_w) X \quad (14)$$

Which implies that,

Case 1: Complete Information and No Corruption

In this case the manager only cares about maximizing stakeholders' welfare ($\alpha = 0$) and according to inequality (13) she will choose the quality and the price per unit of output of the project such that $[s_j - p_j] \geq [s_w - p_w]$. The firm will choose the quality and the price per unit of output of the project in accordance with inequality (16) which implies that $[s_j - p_j] \leq [s_w - p_w]$. So in the case of complete information and no corruption the project will be performed at the competitive market quality per unit of output, s_w, and at the competitive market price per unit of output, p_w.

Case 2: Complete Information and Corruption

In this case the manager cares about the return from expropriation and she also cares about stakeholders' welfare ($0 < \alpha < 1$). Inequality (16) imply that

unless the economy has perfect enforcement of property rights ($\theta = 1$) or the manager is completely benevolent, stakeholders' welfare achieved from performing the project under the prevalence of corruption will always be less than stakeholders'

welfare achieved with no corruption $[(s_j - p_j)X < (s_w - p_w)X]$.

To find the combination of prices and quality per unit of output of the project acceptable to the firm we rearrange inequality (16) above to get:

$$[p_j - s_j] - [p_w - s_w] \geq [\frac{\alpha(1-\theta)f'(e_m)}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]} p_j + \frac{1}{X} f^{-1}[\frac{\alpha\theta(1-\theta)f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]^2} p_j X]] > 0 \quad (17)$$

By examining inequality (17) we see that as long as the manager gets some utility from expropriation ($0 < \alpha < 1$), the firm can always get a greater benefit from winning the bid than from selling the

competitive market quality at the competitive market price. The benefit to the firm is increasing in the manager's preference for expropriation, α, and decreasing in the enforcement of property rights, θ.

$$\frac{\partial}{\partial\theta}[\frac{\alpha(1-\theta)f'(e_m)}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]} p_j + \frac{1}{X} f^{-1}[\frac{\alpha\theta(1-\theta)f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]^2} p_j X]] < 0$$

$$\frac{\partial}{\partial\alpha}[\frac{\alpha(1-\theta)f'(e_m)}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]} p_j + \frac{1}{X} f^{-1}[\frac{\alpha\theta(1-\theta)f'(e_m)[f'(e_s)]^2}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]^2} p_j X]] > 0$$

Which implies that the decline in stakeholders' welfare due to corruption represented by the gap between $(s_j - p_j)X$ and $(s_w - p_w)X$ is increasing in the manager's preference toward

corruption, α, and decreasing in the enforcement of property rights, θ.

We similarly rearrange inequality (13) above to get the combination of prices and quality per unit of output of the project acceptable to the manager:

$$[p_j - s_j] - [p_w - s_w] \leq [\frac{2\alpha^2(1-\theta)f'(e_m) + \alpha\theta f'(e_s)}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]} p_j - \frac{1}{X} f^{-1}[\frac{\alpha^2\theta(1-\theta)f'(e_s)[f'(e_m)]^2}{[\alpha(1-\theta)f'(e_m) + \theta f'(e_s)]^2} p_j X] - \alpha s_j] \quad (18)$$

A necessary condition for inequalities (17) and (18) to hold simultaneously and for the project to be performed is:

$$\alpha \geq \frac{(1-\theta)f(e_m)}{2(1-\theta)f(e_m) + \theta f(e_s)} \quad (19)$$

Examining inequality (19) we see that in the case of very weak enforcement of property rights, $\theta \approx 0$, the private procurement contract will be awarded and the outcome will be suboptimal from stakeholders' point of view only if the manager places more weight on the benefit she gets from expropriation than on the benefit she gets from stakeholders' welfare, $\alpha > 0.5$. The reason behind this result is that for $\theta < 0.5$, if both parties devoted an equal amount of effort to the contest, the outcome would favor the manager. This means that in order to protect its rate of return on investment in the project, the firm will require a premium in the form of a large difference between the profit per unit of output of the project, $[p_j - s_j]$, and the profit per unit of output from selling a competitive market quality project at the competitive market price,

$[p_w - s_w]$. This action by the firm will result in a large reduction in stakeholders' welfare.

In the case of very strong enforcement of property rights, $\theta \approx 1$, the private procurement contract will be awarded and the outcome will be suboptimal from stakeholders' point of view if the manager places some weight on the benefit she gets from expropriation but not necessarily greater than the benefit she gets from stakeholders' welfare, $\alpha > 0$. The reason behind this result is that for $\theta > 0.5$, if both parties devoted an equal amount of effort to the contest, the outcome would favor the firm. This means that the manager will derive more benefit from

maximizing stakeholders' welfare than from expropriation[2].

The above important results indicate that in order for an economy with weak enforcement of property rights, $\theta \approx 0$[3], to arrive at an optimal allocation of resources in private procurement, it is important to align the incentives of the managers' with those of their stakeholders', $\alpha < 0.5$. In this case an improvement in the enforcement of property rights without the alignment of the incentives of the managers' with those of their stakeholders' may not lead to an optimal allocation of resources in private procurement. On the other hand if the economy was able to align the incentives of the managers' with those of their stakeholders', $\alpha < 0.5$, that will necessarily result in an optimal allocation of resources in private procurement. In the case of an economy with strong enforcement of property rights, $\theta \approx 1$, to arrive at an optimal allocation of resources in private procurement, it is important for regulators to completely align the incentives of the managers' with those of their stakeholders', $\alpha \approx 0$. In this case as long as the manager gets some utility from expropriation ($0 < \alpha < 1$), a sub-optimal allocation of resources in private procurement may occur.

One example where the outcome will be suboptimal from stakeholders' point of view is when the firm with the cooperation of the corrupt manager inflates the technical evaluation of its bid and offers a discount after the opening and the technical evaluations of all bids. Even after the discount the benefit to the firm calculated as the difference between the lower price and the lower quality will be greater than the benefit to the firm from selling a competitive market quality project at the competitive market price.

Anechiarico and Jacobs (1996) argue that the pursuit of corruption-free government by means of more rules, procedures, and organizational shuffle is an important contributing factor to government inefficiency. They also argue that it should not be assumed, as it often has been, that corruption controls actually reduce corruption. Langseth, (1999) on the other hand describes two basic arenas in which action can be taken against corruption within a country: "i) the government needs to put in place a solid set of preventive tools. Codes of Conduct and strong independent oversight bodies can help ensure that the acceptable standards of behavior are respected in both the private and public sector. ii) the public needs to be educated on the advantages of good governance and participate in promoting it. The public needs to learn: (a) not to let anybody buy their vote; (b) not to pay bribes themselves; (c) to report incidents of corruption to the authorities; and (d) to teach their children the right values; e.g. that integrity is good and corruption is bad."

3 Conclusion

My results show that in order for an economy with weak enforcement of property rights to arrive at an optimal allocation of resources in private procurement, it is necessary to align the incentives of the managers' with those of their stakeholders'. Improvement in the enforcement of property rights without the alignment of the incentives of the managers' with those of their stakeholders' may not lead to an optimal allocation of resources in private procurement while aligning the incentives of the managers' with those of their stakeholders' will necessarily result in an optimal allocation of resources in private procurement. In the case of an economy with strong enforcement of property rights as long as the manager gets some utility from expropriation, a sub-optimal allocation of resources in private procurement may occur.

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[2] Maximizing social welfare by the manager involves maximizing the difference between the social welfare per unit of output of the project, $[s_j - p_j]$, and the social welfare per unit of output from buying an competitive world quality project at the competitive world price, $[s_w - p_w]$.

[3] In poorer economies property rights are often poorly defined and enforced. Please see Rowat, and Dutta (2006). Also see Beukering, Papyrakis, and Bouma (2013).

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