NBER WORKING PAPER SERIES

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Working Paper 21364
http://www.nber.org/papers/w21364

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 2015

The authors would like to thank Shawn Cole, Navin Kartik, Ramana Nanda, Tom Nycholas, Mike Waldman, Jeff Zwiebel, and seminar participants at Brigham Young University, Cornell, Duke, Fordham, Harvard Business School, HEC Montreal, INSEAD, National University of Singapore, Universite du Quebec a Montreal, Universite Paris 1 Pantheon-Sorbonne, University of Miami, University of New South Wales, Stanford, University of Toronto, and University of Victoria for helpful feedback. The expert research assistance of Huafang Liu is gratefully acknowledged. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

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July 2015
JEL No. D21,G30,H20

ABSTRACT

We study a model in which corporate social responsibility (CSR) arises as a response to inefficient regulation. In our model, firms, governments, and workers interact. Firms generate profits but create negative spillovers that can be attenuated through government regulation, which is set endogenously and may or may not be socially optimal. Governments may choose suboptimal levels of regulation if they face lobbying pressure from companies. Companies can, in turn, hire socially responsible employees who enjoy taking actions to ameliorate the negative spillovers. Because firms can capture part of the rent created by allowing socially responsible employees to correct social ills, in some settings they find it optimal to lobby for inefficient rules and then capture the surplus associated with being "good citizens" in the face of bad regulation. In equilibrium, this means CSR can either increase or decrease social welfare, depending on the costs of political capture.

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1 Introduction

Milton Friedman, in his classic book *Capitalism and Society*, calls corporate social responsibility (CSR) a "fundamentally subversive doctrine," arguing instead that the goal of business should be solely to maximize profits. In his analysis, a democratic political process should implement laws and other strictures to constrain corporate behavior, and corporations in turn should be left free to maximize shareholder returns within these confines. In essence, he argues that it is better to ask a zookeeper to cage a lion rather than to ask the lion to refrain from eating the other animals in the zoo.

Despite the suspicion expressed by Friedman (1963, 1970), Levitt (1958), and many other economists, CSR has become a pervasive feature of the modern corporate landscape. A recent study by KPMG indicates that 95% of the 250 largest global companies now report on their CSR activities (KPMG, 2011). Indeed, many large multinational corporations view CSR as an essential component of good business practice.[1]

One reason why modern corporations embrace CSR might simply be that with global supply chains and a high degree of digital interconnectedness, consumers in the developed world are connected to workers in the developing world to an extent not formerly possible, narrowing the social distance between consumer and producer (Baron, 2010). In such a world, the zookeeper/lion metaphor breaks down: large multinational corporations operate at a scale that is comparable to that of many small national governments (the zookeeper cannot cage the lion), and in many cases it may be infeasible for any single government to have regulatory oversight over a firm's global operations (the lion belongs to many zoos).[2]

Regardless of whether CSR is good for the companies that embrace it, a deeper question is whether it is good for society as a whole. Even if CSR is smart business for the firms that adopt it, is it good for society? When, and under what circumstances, is it preferred to government actions? Put differently, when is CSR socially desirable? These questions are the focus of our analysis.

Complicating the analysis of these questions is the fact that modern corporations not only

[1]The following quote from Nike's 2012 Annual Report expresses this view nicely: "Over time, we've moved from viewing corporate responsibility as a necessity for managing risk to seeing it as an opportunity to create value for our business...We think this is smart business... (Nike Annual Report, 2012)"

[2]Consider, for example, the Danish shipping line, Maersk: it employs around 100,000 people globally, while the Danish workforce comprises around 2.8 million people. Maersk global revenues were about 1/2 as large as the Danish national government's budget in 2011.

commonly pursue objectives that were once largely within the purview of government, they also engage in other forms of political action, like lobbying. Indeed, many policy makers and industry observers express concern that firms engage in lobbying at cross-purposes to their CSR activities. For example, the Global Compact (2005) points to numerous examples of companies that, either indirectly or directly, lobby for legislation that is directly at odds with their CSR agenda. Take for instance British Petroleum: according to SustainAbility (2005) "BP was a signatory to the Corporate Leaders Group on Climate Change letter to the UK prime minister but was subsequently alleged to have been lobbying in the US against Senator Bingaman's proposal for compulsory limits on carbon dioxide emissions." Moreover, scholars in corporate strategy and political science have shown that firms and other organizations earn high returns to political contributions (see Ansolabehere et al (2003), de Figueiredo (2002), or de Figueiredo and Silverman (2006)). Thus, any analysis of the tradeoffs of CSR versus government action must be cast against a broader backdrop in which CSR and corporate political action are allowed to interact.

To address these questions, we develop a simple model in which governments, citizens and firms interact. By placing firms in a context in which they can simultaneously engage in CSR as well as engage in political action, the analysis delivers answers both to the positive question of when CSR arises endogenously as a response to certain economic forces, as well as to the normative question of whether society is better or worse as a result.

In our model, businesses unavoidably generate negative externalities when they operate. The role of government is to set regulatory thresholds that balance a firm's profits against the social costs of these negative externalities. Governments may act in the best interests of society as a whole, or they may be subject to regulatory capture. Firms are standard profit maximizers, but they can choose to engage in CSR by hiring a socially responsible worker who will operate the firm in a manner that generates fewer negative externalities than the law requires. Although this generates lower financial profits, firms may be able to capture other economic rents by behaving this way. Important special cases of our model hinge on how these additional rents are shared between managers and the firm's shareholders.

In our baseline analysis, the objective of government is simply to maximize social welfare. In this version of the model, the fact that firms have the option to hire a socially responsible worker and engage in CSR is neither beneficial nor detrimental to anyone. No one is made better off by their actions, because the government naturally sets the optimal regulatory threshold. In that case, a socially responsible firm cannot improve on the production choice that a purely profit-seeking firm would choose facing the constraints imposed upon it. In this world, CSR would be empirically undetectable: firms that engaged in it would behave identically to those that did not.

The analysis changes substantially when we allow the government to maximize a combination of social welfare and influence payments along the lines of Stigler (1971, 1974), Peltzman (1976), and Becker (1983). This opens the possibility for firms to lobby governments to choose a regulatory threshold that no longer coincides with the social optimum. In fact, in this version of the model firms will always lobby, at least a little, for inefficient regulation, even if they do not find it optimal to engage in CSR.

An important parameter in the model is the government's weighting between social welfare and influence payments. This determines the ease with which inefficient regulation can be purchased through lobbying. At a certain point, firms endogenously create rents for the socially responsible worker by lobbying the government for loose regulatory thresholds; they then let the worker enjoy utility by producing fewer externalities than the law permits and capture these rents through contractual means.[3] This produces two offsetting effects on social welfare. On the one hand, having the option to engage in CSR leads to socially superior operational choices, but on the other hand it leads to more lobbying, imposing deadweight costs on society.

Thus, because CSR fills a void created by inefficient government, social responsibility may or may not be socially desirable depending on whether the deadweight costs associated with inefficient government are small relative to the marginal welfare increase of CSR activity. If government is not too inefficient, then lobbying is relatively expensive, and the deadweight costs to society of lobbying exceed the social value created through the firm's CSR activities. In this case, CSR is not socially desirable. On the other hand, when government is more easily purchased, the social spillovers associated with the allowing the socially responsible worker to make the right decision exceed the deadweight costs of lobbying, and CSR becomes socially desirable on net, even though the problems it addresses were manufactured through the purchase

[3] Compensating wage differentials are one example of how a firm could extract rents from socially responsible workers. There is indeed empirical evidence that workers accept lower wages to work in socially responsible organizations. Nyborg and Zhang (2013) show that firms with a strong reputation for social responsibility pay 38% less than low-quality CSR reputation firms. Similarly, Frank (2004) using survey evidence from Cornell graduates finds a compensating salary differential for corporate social responsibility.

of socially inefficient government action.

We also explore several extensions of our model that allow us to ask whether CSR is desirable from a shareholder perspective. The empirical literature is divided on this point: for example, Cheng, Hong and Shue (2011) argue that agency motives drive CSR activity, offering as evidence a number of distinct results linking exogenous increases in incentives and governance to reductions in CSR activity. In contrast, Edmans (2010) finds that companies recognized for the quality of employee treatment earn risk-adjusted rates of return that are higher than other, non-friendly companies. In our model, whether CSR is good for shareholders hinges on how the rents extracted from socially responsible managers are distributed within the firm. The setting in which rents can be distributed to shareholders (through, for example, lower wages that manifest in higher profits) is one in which CSR unambiguously improves shareholder welfare. In contrast, if rents are captured inside the firm as private benefits, then our model predicts exactly the results offered in Cheng, Hong and Shue (2011). By nesting competing sets of empirical findings, our analysis helps to shed on the mechanisms by which CSR affects shareholder value.

Our work connects to a broader literature in economics examining CSR from positive and normative perspectives.[4] A positive strand examines plausible explanations for CSR and conditions under which it might emerge. These conditions may arise in labor market environments, where CSR may serve as a screening (Brekke and Nyborg, 2004) or signalling (Greening and Turban, 2000) mechanism to attact desirable employees; or as entrenchment by inefficient managers protecting their jobs (Cespa and Cestone, 2007). Alternatively, these propicious conditions for CSR may be present in product markets where consumers have *social* preferences. In this type of environment, CSR may emerge as a result of optimal managerial incentive design (Baron, 2008), or competition in these markets (Arora and Gangopadhay, 1995; Bagnoli and Watts, 2003; Besley and Ghatak, 2007; Galasso and Tombak, 2014). Finally, CSR may arise in political environments, as a hedging response to a threat posed by the "politician" who could be an activist (Baron, 2001; Baron, 2009; Baron and Diermeier, 2007; Lyon and Maxwell, 2011) or a lobbyist influencing government policy (Lyon and Maxwell, 2004; Maxwell et al., 2000). In contrast our analysis shows that firms engaging in CSR may also strategically lobby govern-

[4]For excellent recent overviews of this literature, see Benabou and Tirole (2010) or Kitzmueller and Shimshack (2012).

ments to increase their payoffs from CSR, rather than engage in CSR in response to lobbying by others. A normative strand focuses on whether the overall level of a public good in society increases or decreases based on whether or not the private provision of the public good crowds out its public provision.[5]

The balance of the paper is organized as follows. In Section 2 we lay out the basic setup of the model. In Section 3 we study a version of the model in which government maximizes social welfare. This section illustrates that under efficient government, CSR is completely unnecessary. Then in Section 4 we explore a version of the model in which governments maximize a combination of social welfare and lobbying contributions they receive. Section 5 explores a variety of extensions to the model, while section 6 concludes. *An appendix contains all relevant proofs as well as a detailed discussion of robustness considerations.*

2 Basic Setup

At the core of our model is a firm whose operations unavoidably impose negative externalities on the government's citizens. The firm is engaged in two strategic interactions. First, the firm hires workers to run the company's operations. The strategic interaction between the firm and its labor force determines employee compensation as well as the action workers should take conditional on government-mandated regulations determining the maximum level of externalities. The second is the potential strategic interaction between the firm and the government to influence the equilibrium level of regulation. This section describes the each of these actors in greater detail.

Firms. A firm seeks workers to run the company's operations. Once hired, the worker's main task is to take action $a \in \mathbb{R}_+$ which is expected to affect the firm's profits.

The firm's expected profits $\pi(a)$ are positive, continuously differentiable over $\mathbb{R}_+$ and strictly concave in a, with $\lim_{a \to 0^+} d\pi/da > 0$. Hence there exists a unique $a_\pi = \arg\max \pi(a) > 0$, such that the firm's expected profits are maximized.

To keep the analysis as simple as possible, we assume that the production technology and the nature of the CSR opportunity are tightly coupled. In particular, as we make clear below,

[5]Related to Kotchen (2006) and Besley and Ghatak (2007), Graff Zivin and Small (2005) and Nilsson and Robinson (2012) explore models in which consumers can donate to private charities or can invest in companies that engage in social mission; and explore the conditions under which corporate social responsibility and/or social entrepreneurship will dominate private donations to "pure charities."

we assume that larger values of a generate more negative externalities for citizens. In other words, the CSR is specifically modeled as the act of doing less harm while producing: developers are choosing to cut down fewer trees, textiles are dumping fewer chemicals into lakes, and so forth.

The tight connection between the nature of the CSR and the nature of the productive activity is assumed purely for concreteness and expositional simplicity. Nothing hinges on the specific nature of the connection between the spillover and the main productive activity of the firm. Indeed, in more general settings, there is no reason to think that a firm's productive activity and its CSR initiatives would be so tightly coupled. All that matters for our analysis is that some corporate actions are associated with potentially lower profits but potentially greater social benefit.

For our main analysis, we will assume that firms maximize the sum of the standard profits they obtain from operations as well as any rents they can extract through CSR activity. In Sections 3 and 4 we will put aside the question of who owns the firm, which will allow us to sidestep any differences in how these two sources of rents can be distributed or shared. Then in Section 5 we will consider a number of model extensions that will allow us to examine the welfare implications of CSR for different corporate stakeholders.

Citizens. Citizens are another key player in our model. They take no action on their own behalf, but are negatively affected by the actions taken by the firms. Thus their preferences are important for understanding social welfare.

The citizenry's utility $V(a, q)$ depends on action a and on a vector q of other exogenous factors. For simplicity we assume that $\partial^2 V/\partial a \partial q = 0$ (i.e. the marginal utility of a is independent of other factors) and henceforth omit q in our notation. More importantly we posit that action a creates a negative externality on the citizenry, in that it negatively affects the citizenry's utility: $dV/da < 0$ for all $a \in \mathbb{R}_{++}$. One can think of a as representing a price or a pollution level for example. Clearly, then, the level of a that maximizes $V(a)$ is $a_c = 0$.

In the main analysis, we simply assume that the citizenry is disconnected from the firm and its workers. Although somewhat stark, this framing would be well suited to the case of a citizenry of a country that was home to one piece of a larger global supply chain operated by a multinational corporation. Later we discuss extensions to the model that allow for citizens to be connected to the firm's workers explicitly, or to hold an ownership stake in the firm. Because these extensions do not affect the main results of the model, we postpone them to Section 5.

Workers. There are two types of risk-neutral workers available in the labor market: self-interested (si) workers and socially responsible (sr) ones. Firms can costlessly detect which type of worker they face in the labor market. We abstract away from whether the firm is hiring one or many workers, and use the term *worker* to refer to the firm's labor force generally. Furthermore, we assume that workers are not wealth-constrained, and that action a is verifiable; with the firm making a take-it-or-leave-it, action-contingent contractual offer $W(a)$ to the worker it wishes to hire.[6] Both types of workers have reservation wage W^0 normalized to zero.

Self-interested and socially responsible workers differ in terms of their preferences. The si worker cares only about his own payoff: If he is hired with compensation $W_{si}(a)$, his utility is $U_{si} = W_{si}(a)$. If he is not hired, his reservation utility is $U_{si}^0 = W^0 = 0$.

In contrast the socially responsible (sr) worker cares not only about his compensation, but also about what we call the "core" social surplus associated with action a, $S(a)$, which we define as the sum of 1) the citizenry's utility, 2) the firm's profits net of compensation cost, 3) the hired worker's compensation:

$$S(a) = V(a) + (\pi(a) - W_j) + W_j, \tag{1}$$

with $j = si, sr$, or simply

$$S(a) = V(a) + \pi(a). \tag{2}$$

We use this notion of core surplus for expositional convenience. As shall become clear below, total social surplus (social welfare) will turn out to be a simple function of the core surplus. We assume that $V(a)$ and $\pi(a)$ are such that $S(a)$ is "well-behaved," with $d^2S(.)/da^2 < 0$ and $dS(0)/da > 0$.

[6]We assume symmetric worker-type information, wealth-unconstrained workers and verifiable action for simplicity, in order to abstract away from issues related to hidden information or hidden action between firm and worker. This is in contrast to Carlin and Gervais (2009) for example, who explore an agency model in which some agents suffer from agency costs and some do not. The fact that some agents do not require high-powered incentives to exert effort, in equilibrium, induces sorting between firms and employees. A recent literature has also examined agency problems when agents have special preferences such as intrinsic motivation or prosocial preferences, for example. See, e.g. Benabou and Tirole (2003, 2006), Besley and Ghatak (2005, 2007), Prendergast (2007, 2008), Ellingsen and Johanesson (2008), Delfgaauw and Dur (2008). We make the aforementioned simplifying assumptions in order to bring into sharper focus the connection between social preferences, lobbying, and regulation. We relax these assumptions, and discuss wealth-constrained workers, non-contractible action, and worker-type information asymmetry in some detail in the appendix.

Thus, we specify the utility of a *sr* worker hired with compensation $W_{sr}(a)$ and choosing action a as $U_{sr}(a) = W_{sr}(a) + \rho S(a)$, with $\rho \in (0,1)$, where $\rho S(a)$ is the "responsible" component of his preferences. If he is not hired, the *sr* worker's reservation utility is (the sum of his zero reservation wage and) the core social surplus associated with action a^0 selected in that case (e.g. by the *si* worker if he is hired): $U^0_{sr} = W^0 + \rho S(a^0) = \rho S(a^0)$. Thus, socially responsible employees experience utility that is increasing in the core social surplus regardless of whether or not they are engaged in the alleviation of negative externalities.

Social Responsibility. The parameter $\rho \in (0,1)$ captures the *sr* employee's degree of social responsibility. If $\rho = 0$, $U_{sr} = W_{sr}$, and the *sr* worker is purely self-interested. As ρ increases, however, he applies more weight on overall social surplus relative to his personal compensation.

Government. We assume that transactions costs prevent direct Coasian bargaining between the firm and the citizenry,[7] and that as a result a government emerges that plays an important role as an intermediary between the citizenry and the firm. The government examines both points of view and then affects equilibrium action through regulation.

For simplicity - and in our opinion not unrealistically - we assume that the government cannot verify the exact value of a, and therefore cannot specify its value through regulation. What the government can verify, however, is whether a is superior or inferior to some predetermined threshold. Thus the government can regulate by imposing a verifiable ceiling $\overline{a}$ for action a. (Because negative externalities are monotonically increasing in a, it is never optimal for the government to set a regulatory floor.) Note that the main results of our model would continue to hold even if the government could verify and select an exact regulatory value value for a.

We follow Stigler (1971, 1974), Peltzman (1976), Becker (1983) and others and assume that government seeks to maximize a political support function M, which depends primarily on two factors: the number of votes N that it may receive, and political contributions C. For simplicity, we assume that the number of votes depends directly on contribution of the government's regulatory choice $\overline{a}$ to the core surplus, and normalize N such that $N = S(\overline{a})$. This assumes that, even though in equilibrium the worker and firm may choose an action $a < \overline{a}$, with $S(a) > S(\overline{a})$, voters can separate regulatory thresholds from observed market actions. As

[7] For instance, the citizenry's "fragmentation" may imply high coordination costs for the group's members, which may hinder efficient bargaining, and indeed prevent bargaining altogether.

such, voters value the government's contribution to core surplus as $S(\overline{a})$, with the added core surplus $S(a) - S(\overline{a})$ being the result of the firm's action rather than the government's. This leads to the following reduced-form government political support function:

$$M\left(\overline{a}\right) = \left(1-\gamma\right) S(\overline{a}) + \gamma C(\overline{a}), \tag{3}$$

where $\gamma \in (0,1)$ represents the degree of government inefficiency: as γ increases, the government places less weight on satisfying voters, and more weight on political contributions. When γ is close to zero, the government behave almost like a social welfare maximizer, while as γ approaches 1, the government becomes completely beholden to lobbyists.

Timing of the Game. At date 0, the government examines the citizenry and the firm's points of view, and imposes ceiling $\overline{a}$ on action a. At date 1, the firm makes a take-it-or-leave-it contractual offer to the worker. At date 2, the worker selects action a. At date 3, profits and utilities are realized and contracts are honored.

Social Welfare and the First-Best. Social welfare is the grand total surplus generated, which includes not only the core surplus, $S(a) = V(a) + \pi(a)$ but also the preferences of socially responsible workers', $\rho S(a)$ and the government's preferences. More specifically social welfare here includes 1) the citizenry's utility, 2) the firm's profits net of compensation cost, 3) the hired worker's utility, 4) the other worker's utility, and 5) the government's utility:

$$\begin{aligned} TS\left(a\left(\gamma\right), \overline{a}\left(\gamma\right), C\left(\gamma\right)\right) &= V\left(a\left(\gamma\right)\right) \\ &\quad + \left(\pi\left(a\left(\gamma\right)\right) - W_j - C\right) + W_j + \rho S\left(a\left(\gamma\right)\right) \\ &\quad + \left(1-\gamma\right) S(\overline{a}\left(\gamma\right)) + \gamma C\left(\gamma\right) \end{aligned} \tag{4}$$

with $j = si, sr$, or more simply:

$$TS\left(a\left(\gamma\right), \overline{a}\left(\gamma\right), C\left(\gamma\right)\right) = \left(1+\rho\right) S\left(a\left(\gamma\right)\right) + \left(1-\gamma\right)\left[S(\overline{a}\left(\gamma\right)) - C\left(\gamma\right)\right]. \tag{5}$$

Let us define the first-best benchmark as the situation in which the government is perfectly efficient ($\gamma = 0$), and total surplus is maximized. Because influence payments C involve deadweight costs $(1-\gamma)C$, the first-best outcome requires $C = 0$. This means that in the first-best, the total surplus simplifies to:

$$TS^*(a,\overline{a}) = (1+\rho)\,S(a) + S(\overline{a}). \tag{6}$$

Clearly, the unique first-best ceiling and action are one and the same, and equal to $a^* = \arg\max TS^*(a) = \arg\max S(a)$: they maximize both the core surplus and social welfare. The strict concavity of $S(a)$ ensures existence and uniqueness of a solution. The first-best social welfare can thus be written as $TS^*(a^*) = (2+\rho)\,S(a^*)$.

Note also that a^* depends neither on who is hired, nor on parameter ρ. Note also that $a^* \in (0, a_\pi)$. To see this, consider a) that $dS(0)/da > 0$ by assumption; and b) that $dS(a_\pi)/da = dV(a_\pi)/da < 0$, since $d\pi(a_\pi)/da = 0$ by definition of a_π and $dV(a)/da < 0$ for all $a \in \mathbb{R}_{++}$. The strict concavity of $S(a)$ then implies that there must exist a $a^* \in (0, a_\pi)$ such that $dS(a^*)/da = 0$.

Because Equation 5 captures the overall welfare of citizens, firms, managers and the government, it forms the reference for welfare comparisons throughout the remainder of our analysis.

3 Social Responsibility In a World Without Lobbying

To set the baseline for our analysis, we begin by considering first a government whose objective is to maximize the core surplus $S(a)$. That is, we study a model in which $\gamma = 0$, a model in which government is immune to lobbying pressure. The main result in this section is essentially an irrelevance result: under a government that maximizes social welfare, the presence of socially responsible firms is of no consequence.

Because socially responsible workers internalize the negative consequences of action a no matter whether they work for the firm, the equilibrium when only self-interested workers are available determines the reservation utility of socially responsible workers. Thus, we begin by analyzing the case in which only self-interested workers is available, then we examine the case when the firm can choose between hiring a self-interested or a socially responsible employees.

3.1 Equilibrium with Self-Interested Workers Only

We begin with the case where only the self-interested (si) employee is available for hire; and determine the subgame-perfect Nash equilibrium by backward induction. As is well known, since the worker faces no direct cost associated with a, he selects the firm's preferred action as long as he receives compensation $W_{si} \geq 0$. Thus in equilibrium the firm pays the worker $W_{si} = 0$, and can choose the action a_{si} to be selected by the employee. Clearly, the action that maximizes the firm's payoff $P_{si} = \pi(a) - W_{si} = \pi(a)$ is the profit maximizing action $a_\pi > a^*$. The difference between a_π and the first-best action a^* captures the externality at play here: The firm does not internalize the negative impact of a higher action choice on the citizenry, and hence selects an action level that is too high from a social point of view.

Here, however, the firm's choice of action may be constrained by government regulation. Suppose that at date 0 the government has imposed ceiling $\overline{a}$ for action. Then, taking $\overline{a}$ as given, at date 1 the firm requests the following action from the worker:

$$a_{si} = \left\{ \begin{array}{ccc} \overline{a} & \text{if} & \overline{a} \leq a_\pi \\ a_\pi & \text{if} & \overline{a} > a_\pi \end{array} \right\}. \tag{7}$$

If the action ceiling is not binding, the firm chooses her preferred action a_π; if the ceiling is binding, then the best the firm can do while remaining within the law is to request action a_{si} from the worker exactly equal to the ceiling . Accordingly, the firm's equilibrium payoff P_{si}, can be expressed simply as:

$$P_{si}(\overline{a}) = \left\{ \begin{array}{ccc} \pi(\overline{a}) & \text{if} & \overline{a} \leq a_\pi \\ \pi(a_\pi) & \text{if} & \overline{a} > a_\pi \end{array} \right\}. \tag{8}$$

Moving back one period, the government chooses ceiling $\overline{a}^*_{si}$ to solve the following program:

$$\max_{\overline{a}} \quad S(a_{si}) = \quad \max_{\overline{a}} \quad V(a_{si}) + \pi(a_{si}), \tag{9}$$

subject to condition (7). Clearly, the optimal regulatory ceiling is $\overline{a}^*_{si} = a^*$: since $a^* \in (0, a_\pi)$, this forces the firm to request action $a_{si} = a^*$ from the worker at date 1, and ensures that first-best core surplus $S(a^*)$ and social welfare $TS(a^*) = (2 + \rho) S(a^*)$ are achieved. Indeed, the equilibrium can be described as follows:

Lemma 1 *Under efficient government, and with a profit maximizing firm and a self-interested employee: At date 0, the government sets regulatory ceiling $\overline{a}^*_{si} = a^*$. At date 1, the firm hires the si worker, and requests action $a_{si} = a^*$. At date 2, the si worker takes action a^* and receives compensation $W_{si} = 0$; the firm obtains payoff $\pi(a^*)$, and social surplus $TS(a^*)$ is generated.*

The main result of this section thus follows:

Proposition 1 *Even with a profit-maximizing firm and a self-interested worker, an efficient government can circumvent problems associated with externalities through regulation, and can achieve first-best social welfare.*

3.2 Equilibrium with Both Self-Interested and Socially Responsible Workers

Suppose now that at date 1, the firm has a choice between hiring a self-interested employee, or instead a socially responsible worker who cares about social welfare. If the firm makes an offer to the si type, the remainder of the game is as described in section 3.1: For a given ceiling $\overline{a}$, the requested action a_{si} is defined as in (7), and the firm's payoff P_{si} is defined as in (8).

Now suppose the firm makes a contractual offer $W_{sr}(a)$ to the sr worker. As discussed above, if he accepts the offer and chooses action a, his utility is $U_{sr}(a) = W_{sr}(a) + \rho S(a)$. If he is not hired, the sr worker's reservation utility depends on the action a^0 chosen in that case: $U^0_{sr} = \rho S(a^0)$. For simplicity we assume that if the sr employee turns down the offer, the firm hires the si worker (since this gives the firm a positive payoff P_{si}) who selects $a^0 = a_{si}$, and this in turn implies that $U^0_{sr} = \rho S(a_{si})$.

Consider first the "government-unconstrained" scenario in which no regulatory ceiling is constraining the action requested by the firm from the sr worker. Suppose the firm wishes to elicit an action $\widehat{a}$. In that case, the optimal contract offered to the sr type includes a base salary w_{sr} and an action-contingent bonus b_{sr} such that:

$$W_{sr}(a) = \left\{ \begin{array}{ccc} w_{sr} + b_{sr} & \text{if} & a = \widehat{a} \\ w_{sr} & \text{if} & a \neq \widehat{a} \end{array} \right\}. \tag{10}$$

The action $\widehat{a}$, the base salary w_{sr}, and the bonus b_{sr} are chosen to maximize the firm's program $\pi(\widehat{a}) - (w_{sr} + b_{sr})$, subject to the incentive compatibility (IC) constraint,[8]

$$b_{sr} + \rho S(\widehat{a}) \geq \rho S(a^*), \tag{11}$$

and to the individual rationality (IR) constraint,

$$w_{sr} + b_{sr} + \rho S(\widehat{a}) \geq \rho S(a_{si}). \tag{12}$$

One can easily verify that in equilibrium b_{sr} and w_{sr} are chosen as solutions to binding IC and IR constraints, respectively; and that the equilibrium *"unconstrained" action* a^u_{sr} is the solution that maximizes the following simplified program:

$$\max_{\widehat{a}} \quad \pi(\widehat{a}) + \rho[S(\widehat{a}) - S(a_{si})]. \tag{13}$$

[8]Conditional on not choosing $\widehat{a}$, the worker anticipates he will receive a payoff of $w_{sr} + \rho S(a)$. And the action that maximizes this payoff is a^*.

The intuition is simple: the firm chooses the action a^u_{sr} that maximizes the joint firm-worker surplus; ensures that the employee has an incentive to select this action through the appropriate choice of b_{sr} satisfying (11); and extracts all rents from the worker by choosing the base salary w_{sr} such that (12) is binding.[9]

The firm's payoff, for a given requested action a^u_{sr}, thus includes two components: gross profit $\pi\left(a^u_{sr}\right)$, and the *social responsibility wedge* $\rho\left[S\left(a^u_{sr}\right) - S\left(a_{si}\right)\right]$ extracted from the *sr* employee. This wedge is the difference between the responsible components of the *sr* worker's utility a) if he is hired to take action a^u_{sr} and b) if instead the *si* worker is hired to take action a_{si}.

Given the strict concavity of $\pi\left(.\right)$ and $S\left(.\right)$ and hence of $\pi\left(.\right) + \rho S\left(.\right)$, the unique unconstrained action a^u_{sr} maximizing program (13) can be expressed as the solution to:

$$\frac{d\pi\left(a^u_{sr}\right)}{d\widehat{a}} + \rho\frac{dS\left(a^u_{sr}\right)}{d\widehat{a}} = 0. \tag{14}$$

Note that $a^u_{sr} \in \left(a^*, a_\pi\right)$. This follows directly from the strict concavity of $\pi\left(.\right) + \rho S\left(.\right)$; and from the fact that $dS\left(a^*\right)/da = 0$ and $d\pi\left(a_\pi\right)/da = 0$, with $a^* < a_\pi$ as shown previously. Intuitively, equilibrium unconstrained action a^u_{sr} maximizes a linear combination of two strictly concave functions, $S\left(.\right)$ and $\pi\left(.\right)$, and hence the solution to this linear combination should be between the solutions a^* and a_π to the two strictly concave functions.

Clearly, as in the case of the *si* employee, here again the equilibrium action chosen depends on whether or not the firm is constrained by the previously determined regulatory ceiling $\overline{a}$. This equilibrium action with the *sr* worker can be expressed as follows:

$$a_{sr} = \left\{ \begin{array}{ccc} \overline{a} & \text{if} & \overline{a} \leq a^u_{sr} \\ a^u_{sr} & \text{if} & \overline{a} > a^u_{sr} \end{array} \right\}. \tag{15}$$

Using (7) and (15), we can express the firm's equilibrium payoff if it hires the *sr* worker, P_{sr}, as follows:

$$P_{sr}\left(\overline{a}\right) = \left\{ \begin{array}{lll} \pi\left(\overline{a}\right) & \text{if} & \overline{a} \in \left[0, a^u_{sr}\right] \\ \\ \pi\left(a^u_{sr}\right) + \rho\left[S\left(a^u_{sr}\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in \left(a^u_{sr}, a_\pi\right] \\ \\ \pi\left(a^u_{sr}\right) + \rho\left[S\left(a^u_{sr}\right) - S\left(a_\pi\right)\right] & \text{if} & \overline{a} \in \left(a_\pi, +\infty\right) \end{array} \right\}. \tag{16}$$

[9] A concrete example of how a firm could extract rents from socially responsible workers would be through compensating wage differentials. There is indeed empirical evidence that workers accept lower wages to work in socially responsible organizations. Nyborg and Zhang (2013) show that firms with a strong reputation for social responsibility pay 38% less than low-quality CSR reputation firms. This difference drops to about 24% when one accounts for industry and gender/demographic composition of the work force. Similarly, Frank (2004) using survey evidence from Cornell graduates finds a compensating salary differential for corporate social responsibility.

Comparing the firm's payoffs defined in (8) and (16), we can now determine the firm's optimal choice of employee type and the associated equilibrium action for a given regulatory ceiling $\overline{a}$.

For all $\overline{a} \in [0, a_{sr}^u]$, it follows directly from (7) and (15) that the equilibrium action selected is the same regardless of the type of worker hired: $a_{sr} = a_{si} = \overline{a}$. This in turn implies $P_{sr}(\overline{a}) = P_{si}(\overline{a}) = \pi(\overline{a})$: the firm is indifferent between the two types of workers. Since both types choose the same action $\overline{a}$, the sr worker derives no additional utility from selecting a more socially responsible action - the social responsibility wedge $\rho[S(\overline{a}) - S(a_{si})]$ collapses to zero - and hence there is no additional utility to be extracted by the firm.

For all $\overline{a} \in (a_{sr}^u, +\infty)$, in equilibrium we have $a_{sr} = a_{sr}^u$ and $a_{si} = \min(\overline{a}, a_\pi)$, with $a_{sr}^u < a_{si}$. Note that in this case the firm could choose to elicit action a_{si} from the sr type, in which case the payoff would be the same from either worker. Yet the firm chooses to elicit $a_{sr}^u \neq a_{si}$ from the sr worker, which implies that the payoff from doing so is strictly superior to the payoff from eliciting a_{si} (by the strict concavity of $\pi(.) + \rho S(.)$). And this in turn implies that $P_{sr}(\overline{a}) > P_{si}(\overline{a})$: the firm is strictly better off by hiring a sr worker over a si worker. Intuitively, when the sr employee is hired and the ceiling $\overline{a}$ is not too restrictive, a positive social responsibility wedge $\rho[S(a_{sr}^u) - S(a_{si})]$ is created, that can be extracted by the firm via lower compensation for the sr worker.

In sum, for a given ceiling $\overline{a}$, we can express the firm's hiring choice and the equilibrium action a_{ch} as follows:[10]

$$\left\{ \begin{array}{ll} \text{If } \overline{a} \in [0, a_{sr}^u]: & \text{The firm is indifferent betw. types, requests action } a_{ch} = \overline{a} \\ \text{If } \overline{a} \in (a_{sr}^u, +\infty): & \text{The firm hires } sr \text{ worker, requests action } a_{ch} = a_{sr}^u \end{array} \right\}. \quad (17)$$

This logic is depicted graphically in Figures 1 and 2, which capture equilibrium actions and profits, respectively, as functions of the regulatory ceiling $\overline{a}$, depending on whether the si or the sr type is hired.

[INSERT FIGURES 1 AND 2 ABOUT HERE]

The critical value for ceiling $\overline{a}$ in both figures is a_{sr}^u, the ceiling value at which the equilibrium actions of the si and the sr type begin to differ. To the left of a_{sr}^u, the ceiling is binding, and the

[10] Subscript ch refers to situations when the firm has a *choice* between hiring either type of manager.

equilibrium action is the same regardless of whom is hired, as shown in Figure 1. Accordingly, the firm's payoff is also indenpendent of the type being hired, as depicted in Figure 2.

To the right of a^u_{sr}, the firm deliberately requires a lower action a_{sr} from the sr employee than it would from the self-interested type. It does so to generate the social responsibility wedge $\rho\left[S\left(a_{sr}\right)-S\left(a_{si}\right)\right]$ for the sr worker, which it extracts through contractual means, thus increasing its overall payoff. The lower equilibrium action $a_{sr}\left(\overline{a}\right)<a_{si}\left(\overline{a}\right)$ and greater profits $P_{sr}\left(\overline{a}\right)>P_{si}\left(\overline{a}\right)$ under sr management are depicted in Figures 1 and 2, respectively.

Anticipating all this, at date 0 the government chooses ceiling $\overline{a}^*_{ch}$ to solve the following program:

$$\max_{\overline{a}} \quad S\left(a_{ch}\right)= \quad \max_{\overline{a}} \quad V\left(a_{ch}\right)+\pi\left(a_{ch}\right), \tag{18}$$

subject to condition (17). As in the previous scenario where only the si worker was available, here the optimal regulatory ceiling for the government is $\overline{a}^*_{ch}=a^*$: since $a^*\in\left(0,a^u_{sr}\right)$, this forces the firm to request action $a_{ch}=a^*$ from either type at date 1, and ensures that first-best core surplus $S\left(a^*\right)$ and social welfare $TS\left(a^*\right)=\left(2+\rho\right)S\left(a^*\right)$ are achieved.

We summarize these results in the following lemma:

Lemma 2 *Under efficient government, when the firm can choose between a self-interested or a socially responsible worker: At date 0, the government sets regulatory ceiling $\overline{a}^*_{ch}=a^*$. At date 1, the firm hires either type, requesting the same action a^* either way. At date 2, the hired worker takes action a^* and receives compensation $W_{si}=W_{sr}=0$; the firm obtains payoff $\pi\left(a^*\right)$; and social welfare $TS\left(a^*\right)$ is generated.*

Thus two primary results emerge from this section:

Proposition 2 *Under efficient government, social responsibility neither makes the firm better off nor has any impact on social welfare.*

Qualitatively, this irrelevance result is altogether different than those explored in Graff Zivin and Small (2005) or Baron (2007). In their analysis, no government exists, but consumers have preferences over direct or delegated philanthropy. In these models, the irrelevance result stems from the fact that CSR can crowd out individual philanthropy. In our model, the direct philanthropy channel is suppressed, and the irrelevance stems from the fact that a well-functioning government is a perfect substitute for CSR. Of course, this results hinges critically on the fact that the government maximizes social welfare. As the next section illustrates, the analysis changes considerably when we allow for governments to be susceptible to lobbying pressure.

4 CSR When Firms Can Lobby the Government

Now we relax the assumption that $\gamma = 0$ and consider a model in which governments can be influenced by lobbying contributions. We refer to a government that is prone to lobbying pressure as an inefficient government. As discussed in Section 2, we assume that the government's regulatory ceiling $\overline{a}$ is verifiable. Hence the firm can offer, at date 0, a (take-it-or-leave-it) ceiling-contingent contract to the government, consisting of a political contribution C^{**} if a specific regulatory ceiling $\overline{a}^{**}$ is chosen, and zero otherwise.

As before, we proceed by first considering a world in which only self-interested workers exist. The sets the reservation utility for socially responsible types. For a given regulatory ceiling $\overline{a}$, the equilibrium between the firm and either type plays out exactly as before. The difference now, however, is that lobbying may cause the equilibrium level of regulation to deviate from the first best, creating scope for the firm to pursue CSR in equilibrium.

4.1 Lobbying Equilibrium with Self-Interested Workers Only

For a given regulatory ceiling $\overline{a}$, from date 1 onward the analysis proceeds exactly as in Section 3.1. The key difference is that now the firm can contract with the government at date 0. The firm chooses a regulatory ceiling level $\overline{a}_{si}^{**}$ and political contribution C_{si}^{**} that maximize the following program:[11]

$$\max_{\overline{a},C} \quad P_{si}\left(\overline{a}\right) - C = \quad \max_{\overline{a},C} \quad \pi\left(\overline{a}\right) - C, \tag{19}$$

subject to the government's IR constraint:[12] $(1-\gamma) S\left(\overline{a}\right) + \gamma C \geq (1-\gamma) S\left(a^{*}\right)$. The IR constraint is binding, yielding:

$$C = \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right], \tag{20}$$

and the firm's date 0 program simplifies to:

$$\max_{\overline{a}} \quad U_{si}\left(\overline{a}\right) = \pi\left(\overline{a}\right) - \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right]. \tag{21}$$

[11]It is easy to see that the firm's objective function, $P_{si}\left(\overline{a}\right) - C$, simplifies to $\pi\left(\overline{a}\right) - C$. Clearly $P_{si}\left(\overline{a}\right) = \pi\left(\overline{a}\right)$ since it would never be optimal to have $\overline{a} > a_{\pi}$: it would require a higher cost C without additional benefit.

[12]If it does not accept the firm's offer, the government ends up maximizing $(1-\gamma) S\left(\overline{a}\right)$ and we know from section 3.1 that this yields $\overline{a} = a^{*}$.

Given the strict concavity of $\pi(.)$ and $S(.)$ and hence of $U_{si}(.)$, the unique equilibrium regulatory ceiling $\overline{a}_{si}^{**}(\gamma)$ maximizing the firm's program can be expressed as the solution to:

$$\frac{d\pi\left(\overline{a}_{si}^{**}\right)}{d\overline{a}}+\frac{1-\gamma}{\gamma}\frac{dS\left(\overline{a}_{si}^{**}\right)}{d\overline{a}}=0. \tag{22}$$

Note that equilibrium regularity ceiling $\overline{a}_{si}^{**}$ is strictly increasing in government inefficiency: $\frac{d\overline{a}_{si}^{**}}{d\gamma}>0$. Intuitively, as γ increases, the government cares relatively more about financial contributions, and the firm's marginal cost of raising the regulatory ceiling above a^* ($-\frac{1-\gamma}{\gamma}\frac{dS(\overline{a})}{d\overline{a}}$ with $\frac{dS(\overline{a})}{d\overline{a}}<0$ for all $\overline{a}>a^*$) declines. Accordingly, this leads to an increase in the contracted regulatory ceiling $\overline{a}_{si}^{**}$ above a^*.

At one end of the spectrum, when the government is almost perfectly efficient and $\gamma\to 0$, the firm's marginal cost of lobbying to raise the ceiling above a^* is extremely high, and hence the contracted ceiling $\overline{a}_{si}^{**}$ approaches a^*. At the other end of the spectrum, when the government is almost perfectly inefficient and $\gamma\to 1$, the firm's marginal cost of lobbying tends to zero and the contracted ceiling $\overline{a}_{si}^{**}$ approaches the firm's profit-maximizing action a_π.

Thus, for all $\gamma\in(0,1)$, the equilibrium regulatory ceiling $\overline{a}_{si}^{**}\in(a^*,a_\pi)$. One implication from this is that $C_{si}^{**}(\gamma)=\frac{1-\gamma}{\gamma}\left[S(a^*)-S\left(\overline{a}_{si}^{**}\right)\right]>0$: influence payments are strictly positive in equilibrium. Another implication from this and from (7) is that the equilibrium ceiling is binding (since $\overline{a}_{si}^{**}<a_\pi$) and hence that at date 1 the firm requests action $a_{si}=\overline{a}_{si}^{**}$ from the *si* worker. In sum, the equilibrium can be described as follows:

Lemma 3 *For any given $\gamma\in(0,1)$, and with a self-interested employee: At date 0 the firm makes political contribution $C_{si}^{**}(\gamma)>0$ to the government, in exchange for setting regulatory ceiling $\overline{a}_{si}^{**}(\gamma)$, with $\overline{a}_{si}^{**}(\gamma)\in(a^*,a_\pi)$, and $d\overline{a}_{si}^{**}/d\gamma>0$. At date 1, the firm hires the si worker, and requests action $a_{si}=\overline{a}_{si}^{**}(\gamma)$. At date 2, the si worker takes action $\overline{a}_{si}^{**}(\gamma)$ and receives compensation $W_{sr}\left(\overline{a}_{si}^{**}(\gamma)\right)$; and the firm obtains payoff $\pi\left(\overline{a}_{si}^{**}(\gamma)\right)$.*

We underline two sets of implications emerging from Lemma 3. First, as long as the government is not perfectly efficient, some lobbying will occur in equilibrium. More formally:

Proposition 3 *As long as $\gamma>0$, some lobbying always occurs in equilibrium: the firm offers the government $C_{si}^{**}(\gamma)>0$ in exchange for raising the regulatory ceiling $\overline{a}_{si}^{**}$ above the first-best level a^*.*

Intuitively, at the first-best ceiling a^*, social surplus is maximized and a small increase in the ceiling has little impact on social surplus. Hence as long as the government cares even a little bit about influence payments - i.e. if $\gamma > 0$ - it can be convinced to raise the ceiling a bit beyond the first-best level, to $\overline{a}_{si}^{**} > a^*$ in exchange for a small political contribution $C_{si}^{**} \approx 0$. For the firm, this is worth doing, since at a^* the cost of the contribution is negligible and it stands to gain a lot - $\pi'(a^*) > 0$ - from raising the ceiling above a^*.

The second set of implications concerns the three types of inefficiencies that arise in equilibrium. To see this, consider the difference between the second-best equilibrium social welfare $TS_2(a_{si}(\gamma), \overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma))$ - obtained by substituting equilibrium ceiling, action, and influence payment into (5) - from and the first-best social welfare:

$$TS^*(a^*) - TS_2(a_{si}(\gamma), \overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma)) = \begin{array}{l} [S(a^*) - (1-\gamma) S(\overline{a}_{si}^{**}(\gamma))] \\ + (1-\gamma) C_{si}^{**}(\gamma) + (1+\rho)[S(a^*) - S(a_{si}(\gamma))] \end{array} \tag{23}$$

First, by lobbying government, the firm ensures that the regulatory ceiling is raised to $\overline{a}_{si}^{**}(\gamma)$, strictly above the first-best action a^*. This lowers voters' perception of the government's contribution to core surplus through regulation, from $S(a^*)$ to $S(\overline{a}_{si}^{**}(\gamma))$. Since a government of inefficiency γ only values a fraction $(1-\gamma)$ of the voters' perception, this *ceiling inefficiency* can be expressed as $S(a^*) - (1-\gamma) S(\overline{a}_{si}^{**}(\gamma))$.

Second, this increase in the regulatory ceiling above the the first-best level requires influence payments $C_{si}^{**}(\gamma)$ from the firm to the government. But for every dollar that the firm spends on political contributions, only $\gamma < 1$ dollar is actually improving the government's utility, while the remaining $(1-\gamma)$ goes "down the drain," thus leading to a *contribution inefficiency* $(1-\gamma) C_{si}^{**}(\gamma)$. Note that one way to intepret $(1-\gamma)$ is as a the government's disutility of accepting a dollar of contribution. This could be the expected cost of getting caught and going to jail (in the case of illegal contributions), or simply the cost of a guilty conscience (in the case of legal or illegal contributions).

Finally, the higher regulatory ceiling leads to a greater action $a_{si}(\gamma) = \overline{a}_{si}^{**}(\gamma) > a^*$ being chosen in equilibrium. This *action inefficiency* leads to a decrease $S(a^*) - S(a_{si}(\gamma))$ in core surplus, and to a further decrease $(1+\rho)[S(a^*) - S(a_{si}(\gamma))]$ in social welfare. Thus:

Proposition 4 *For $\gamma > 0$ and self-interested workers, ceiling, contribution and action inefficiencies lead to a second-best social surplus $TS_2(a_{si}(\gamma), \overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma)) < TS_2(a^*)$.*

4.2 Lobbying Equilibrium with Both Self-Interested and Socially Responsible Workers

Now suppose again that at date 1, the firm has a choice between hiring a *si* or a *sr* type. For a given regulatory ceiling $\overline{a}$, from date 1 onwards the equilibrium is exactly the same as in Section 3.2. If $\overline{a} \leq a_{sr}^u$, with $a_{sr}^u \in (a^*, a_\pi)$, as stated in (17) the firm is indifferent between the two types. Either way the firm must ask the employee to select action a_{ch} equal to the binding regulatory ceiling $\overline{a}$; yielding gross profit $\pi(\overline{a})$. In contrast, if $\overline{a} > a_{sr}^u$, the ceiling is no longer binding if the firm hires the *sr* worker, and doing so enables the firm to extract the social responsibility wedge $\rho\left[S\left(a_{sr}^u\right) - S\left(a_{si}\right)\right]$, with $a_{si} = \min\left(\overline{a}, a_\pi\right)$, from the *sr* type. Accordingly, the firm strictly prefers to hire the *sr* type in that case.

Anticipating all this, when contracting with the government at date 0 the firm chooses a regulatory ceiling level $\overline{a}_{ch}^{**}$ and influence payment C_{ch}^{**} that maximize the following program:

$$\max_{\overline{a},C} \left\{ \begin{array}{lll} \pi\left(\overline{a}\right) - C & \text{if} & \overline{a} \in [0, a_{sr}^u] \\ \pi\left(a_{sr}^u\right) + \rho\left[S\left(a_{sr}^u\right) - S\left(\overline{a}\right)\right] - C & \text{if} & \overline{a} \in (a_{sr}^u, a_\pi] \\ \pi\left(a_{sr}^u\right) + \rho\left[S\left(a_{sr}^u\right) - S\left(a_\pi\right)\right] - C & \text{if} & \overline{a} \in (a_\pi, +\infty) \end{array} \right\}, \tag{24}$$

subject to the government's IR constraint: $(1-\gamma)\, S\left(\overline{a}\right) + \gamma C \geq (1-\gamma)\, S\left(a^*\right)$. This IR constraint is binding, and defines the equilibrium political contribution $C\left(\overline{a}\right)$ as a function of the negotiated regulatory ceiling $\overline{a}$:

$$C\left(\overline{a}\right) = \frac{1-\gamma}{\gamma}\left[S\left(a^*\right) - S\left(\overline{a}\right)\right]. \tag{25}$$

Thus, the firm's date 0 program simplifies to:

$$\max_{\overline{a}} \quad U_{ch}\left(\overline{a}\right) = \left\{ \begin{array}{lll} \pi\left(\overline{a}\right) - \frac{1-\gamma}{\gamma}\left[S\left(a^*\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in [0, a_{sr}^u] \\ \pi\left(a_{sr}^u\right) + \rho\left[S\left(a_{sr}^u\right) - S\left(\overline{a}\right)\right] - \frac{1-\gamma}{\gamma}\left[S\left(a^*\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in (a_{sr}^u, a_\pi] \\ \pi\left(a_{sr}^u\right) + \rho\left[S\left(a_{sr}^u\right) - S\left(a_\pi\right)\right] - \frac{1-\gamma}{\gamma}\left[S\left(a^*\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in (a_\pi, +\infty) \end{array} \right\}. \tag{26}$$

Let us consider the equilibrium value $\overline{a}_{ch}^{**}$ of the ceiling determined at date 0 as solution to (26). First, note that it is never in the firm's interest to negotiate a ceiling $\overline{a} > a_\pi$. The firm's benefit from negotiating a ceiling $\overline{a} > a^u_{sr}$ is that it serves as commitment to request action $\overline{a}$ from the si type if the sr type turns down the firm's employment offer and the si worker is hired in his stead. This creates a social responsibility wedge $\rho\left[S\left(a^u_{sr}\right) - S\left(\overline{a}\right)\right]$ for the sr type, which the firm can then extract. But even if $\overline{a} > a_\pi$, the maximum action that the firm can commit to request from the si worker is a_π,[13] and hence the maximum wedge that the firm can generate is $\rho\left[S\left(a^u_{sr}\right) - S\left(a_\pi\right)\right]$. Indeed, there is no reason for the firm to pay the government to raise $\overline{a}$ beyond a_π because it would yield no additional benefit.

Second, let us define a threshold level of government inefficiency $\gamma_{sr} = 1/\left(1+\rho\right)$; and interpret $\gamma \leq \gamma_{sr}$ as *relatively efficient government* and $\gamma > \gamma_{sr}$ as *relatively inefficient government.* Consider relatively efficient government: $\gamma \leq \gamma_{sr}$ implies $\rho \leq \frac{1-\gamma}{\gamma}$, which in turn implies that the marginal cost $-\frac{1-\gamma}{\gamma}S'\left(\overline{a}\right)$ of lobbying to raise the ceiling above a^u_{sr} is greater than the marginal rent-extraction benefit $-\rho S'\left(\overline{a}\right)$, and hence the firm never lobbies for $\overline{a} > a^u_{sr}$ with a relatively efficient government. As in Section 4.1, when the government is almost perfectly efficient and $\gamma \to 0$, the firm's marginal cost of lobbying to raise the ceiling above a^* is extremely high, and accordingly the contracted ceiling $\overline{a}^{**}_{ch}$ approaches a^*. As government inefficiency γ increases, the firm's marginal cost of lobbying declines, thus leading to an increase in contracted ceiling $\overline{a}^{**}_{ch}$, with $\overline{a}^{**}_{ch} = a^u_{sr}$ at the threshold $\gamma_{sr} = 1/\left(1+\rho\right)$. Thus, under efficient government the firm negotiates $\overline{a}^{**}_{ch} \in \left(a^*, a^u_{sr}\right]$, and as discussed above remains indifferent between hiring either type of worker.

Now consider relatively inefficient government: $\gamma > \gamma_{sr}$ implies $\rho > \frac{1-\gamma}{\gamma}$. Here the marginal cost $-\frac{1-\gamma}{\gamma}S'\left(\overline{a}\right)$ of raising the ceiling above a^u_{sr} is smaller than the marginal rent-extraction benefit $-\rho S'\left(\overline{a}\right)$, and this for all $\overline{a} \in \left(a^u_{sr}, a_\pi\right]$. Hence the optimal strategy for the firm is to set $\overline{a}^{**}_{ch} = a_\pi$: it maximizes the size $\rho\left[S\left(a^u_{sr}\right) - S\left(a_\pi\right)\right]$ of the social responsibility wedge to be extracted from the sr worker. Clearly in that case the firm strictly prefers hiring the sr type.

We state the equilibrium in the following lemma:[14]

Lemma 4 *As long as $\gamma > 0$, when the firm can choose between a self-interested or a socially responsible worker, two cases arise:*

- *Relatively efficient government ($\gamma \leq \gamma_{sr}$). At date 0 the firm makes political contribu-*

[13] Recall that for all $\overline{a} \in \left[a^u_{sr}, +\infty\right)$, the regulatory ceiling is not binding, and we have $a_{sr} = a^u_{sr}$ and $a_{si} = \min\left(\overline{a}, a_\pi\right)$

[14] See formal proof in the appendix.

tion $C^{**}_{ch}(\gamma) > 0$ to the government, in exchange for setting regulatory ceiling $\overline{a}^{**}_{ch}(\gamma)$, with $\overline{a}^{**}_{ch}(\gamma) \in (a^*, a^u_{sr}]$ and $d\overline{a}^{**}_{ch}/d\gamma > 0$. At date 1, the firm hires either type and requests action $a_{ch} = \overline{a}^{**}_{ch}(\gamma)$. At date 2, the hired worker takes action $\overline{a}^{**}_{ch}(\gamma)$ and receives compensation $W_{si}(\overline{a}^{**}_{ch}(\gamma)) = W_{sr}(\overline{a}^{**}_{ch}(\gamma))$; and the firm obtains payoff $\pi(\overline{a}^{**}_{ch}(\gamma))$.

- *Relatively inefficient government ($\gamma > \gamma_{sr}$). At date 0 the firm makes political contribution $C^{**}_{ch}(\gamma) > 0$ to the government, in exchange for setting regulatory ceiling $\overline{a}^{**}_{ch}(\gamma) = a_\pi$. At date 1, the firm hires the sr type and requests action $a_{ch} = a^u_{sr}$. At date 2, the hired sr worker takes action a^u_{sr} and receives compensation $W_{sr}(a^u_{sr})$; and the firm obtains the total payoff $\pi(a^u_{sr}) + \rho[S(a^u_{sr}) - S(a_\pi)]$.*

Similar to Section 4.1, the expression for equilibrium social welfare can be written as $TS_2(a_{ch}(\gamma), \overline{a}^{**}_{ch}(\gamma), C^{**}_{ch}(\gamma))$, obtained by substituting equilibrium ceiling, action, and influence payment into (5). The overall decrease in social welfare associated with this equilibrium can then be written as:

$$TS^*(a^*) - TS_2(a_{ch}(\gamma), \overline{a}^{**}_{ch}(\gamma), C^{**}_{ch}(\gamma)) = \begin{array}{l}[S(a^*) - (1-\gamma)S(\overline{a}^{**}_{ch}(\gamma))] \\ + (1-\gamma)C^{**}_{ch} + (1+\rho)[S(a^*) - S(a_{ch}(\gamma))]\,.\end{array} \tag{27}$$

This welfare decrease includes a *ceiling inefficiency* $[S(a^*) - (1-\gamma)S(\overline{a}^{**}_{ch}(\gamma))]$; a *contribution inefficiency* $(1-\gamma)C^{**}_{ch}$, and an *action inefficiency* $(1+\rho)[S(a^*) - S(a_{ch}(\gamma))]$, as described in Section 4.1.

4.3 The Social Impact of Social Responsibility

What is the the impact of social responsibility - i.e. of the labor market availability of a *sr* type worker - on the firm, and on social welfare?

Impact on the firm. When the government is relatively efficient ($\gamma \leq \gamma_{sr}$), then as discussed above if both types of workers are available to the firm it is never optimal to lobby for a ceiling $\overline{a} > a^u_{sr}$. Hence, comparing (21) and (26), it is easy to see that the firm's maximization program at date 0 is the same whether it can hire the *si* type only, or either type of worker, at date 1. Unsurprisingly then, in equilibrium regulatory ceilings, actions, and date 0 payoffs for the firm, are identical under both scenarios: $\overline{a}^{**}_{si}(\gamma) = \overline{a}^{**}_{ch}(\gamma)$, $a_{si} = a_{ch}$, and $U_{ch}(\overline{a}^{**}_{ch}(\gamma)) = U_{si}(\overline{a}^{**}_{si}(\gamma))$ for all $\gamma \leq \gamma_{sr}$.

In contrast, when the government is relatively inefficient ($\gamma > \gamma_{sr}$), the availability of the *sr* type in the labor market clearly makes the firm better off, because the firm can use lobbying to create a social responsibility wedge $\rho\left[S\left(a_{sr}^{u}\right) - S\left(a_{\pi}\right)\right]$, which it extracts through contractual means. Thus, $U_{ch}\left(\overline{a}_{ch}^{**}\left(\gamma\right)\right) > U_{si}\left(\overline{a}_{si}^{**}\left(\gamma\right)\right)$ for all $\gamma > \gamma_{sr}$.

Proposition 5 *When the government is relatively efficient ($\gamma \leq \gamma_{sr}$), social responsibility has no impact on the firm's payoff. When the government is relatively inefficient ($\gamma > \gamma_{sr}$), socially responsibility makes the firm strictly better off.*

The main intuition behind these results is illustrated in Figure 3, which captures equilibrium regulatory ceilings $\overline{a}_{si}^{**}\left(\gamma\right)$ and $\overline{a}_{ch}^{**}\left(\gamma\right)$, as functions of government inefficiency γ, when only *si* managers are available and when both types of workers are available, respectively.

[INSERT FIGURE 3 ABOUT HERE]

The critical government inefficiency threshold γ_{sr} is a function of $\rho \in (0,1)$ and thus must lie between $\frac{1}{2}$ and 1. To the left of γ_{sr}, the government is sufficiently well-functioning that the firm is indifferent between hiring the two types of employees. Lobbying occurs in equilibrium, as the firm negotiates a regulatory ceiling superior to a^{*}, but the level of lobbying is below what is required to make CSR desirable. Whether or not a socially responsible workers are available in the labor market, the equilibrium level of lobbying remains the same: $\overline{a}_{si}^{**}\left(\gamma\right) = \overline{a}_{ch}^{**}\left(\gamma\right)$.

To the right of γ_{sr}, the ability to engage in CSR dramatically changes the picture. The firm now has an incentive to increase lobbying from a ceiling of $\overline{a}_{si}^{**}\left(\gamma\right)$ to a ceiling of $\overline{a}_{ch}^{**}\left(\gamma\right) = a_{\pi}$. It couples this with a socially responsible action a_{sr}^{u}, creating a social responsibility wedge which the firm captures contractually. Thus, in this region the firm's payoff is the profits from regular operations plus the value of the social responsibility wedge it extracts. As we discuss in the next section, when we expand the model to allow for these rents to be pledged differently between the firm's insiders and its shareholders, a range of empirical predictions emerge.

Impact on social welfare. When the government is relatively efficient ($\gamma \leq \gamma_{sr}$), as discussed regulatory ceilings and actions are the same whether or not the firm employees socially minded workers: $a_{si} = \overline{a}_{si}^{**}\left(\gamma\right) = \overline{a}_{ch}^{**}\left(\gamma\right) = a_{ch}$. As a result social welfare is the same in both cases: $TS_{2}\left(a_{ch}\left(\gamma\right), \overline{a}_{ch}^{**}\left(\gamma\right), C_{ch}^{**}\left(\gamma\right)\right) = TS_{2}\left(a_{si}\left(\gamma\right), \overline{a}_{si}^{**}\left(\gamma\right), C_{si}^{**}\left(\gamma\right)\right)$ for all $\gamma \leq \gamma_{sr}$.

In contrast, when $\gamma > \gamma_{sr}$, CSR has three distinct effects, which we highlight by subtracting $TS_2\left(a_{si}(\gamma), \overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma)\right)$ from $TS_2\left(a_{ch}(\gamma), \overline{a}_{ch}^{**}(\gamma), C_{ch}^{**}(\gamma)\right)$:

$$\begin{aligned}
\Delta TS_2(\gamma) &= TS_2\left(a_{ch}(\gamma), \overline{a}_{ch}^{**}(\gamma), C_{ch}^{**}(\gamma)\right) - TS_2\left(a_{si}(\gamma), \overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma)\right) \\
&= (1+\rho)\left[S\left(a_{ch}(\gamma)\right) - a_{si}(\gamma)\right] + (1-\gamma)\left[S\left(\overline{a}_{ch}^{**}(\gamma)\right) - S\left(\overline{a}_{si}^{**}(\gamma)\right)\right] \\
&\quad - (1-\gamma)\left[C_{ch}^{**}(\gamma) - C_{si}^{**}(\gamma)\right] \\
&= (1+\rho)\left[S\left(a_{sr}^{u}\right) - S\left(\overline{a}_{si}^{**}(\gamma)\right)\right] - \tfrac{1-\gamma}{\gamma}\left[S\left(\overline{a}_{si}^{**}(\gamma)\right) - S\left(a_{\pi}\right)\right]. \qquad (28)
\end{aligned}$$

On the one hand, generating the social responsibility wedge requires a lower equilibrium action $a_{sr}^{u} < a_{si} = \overline{a}_{si}^{**}$ than would otherwise be chosen;[15] and this lower equilibrium action leads to a higher core surplus: $S\left(a_{sr}^{u}\right) > S\left(\overline{a}_{si}^{**}\right)$. This in turn yields a welfare benefit $(1+\rho)\left[S\left(a_{sr}^{u}\right) - S\left(\overline{a}_{si}^{**}\right)\right]$ of social responsibility. In other words, *CSR mitigates the action inefficiency* that would arise with a self-interested worker only.

On the other hand, anticipating it will pursue CSR at date 1, the firm lobbies the government for a very high regulatory ceiling $\overline{a}_{ch}^{**} = a_{\pi}$, higher in fact than the ceiling $\overline{a}_{si}^{**}$ that would be contracted if it were not going to generate the social responsibility wedge. But of course this higher ceiling comes with greater influence payments: $C_{ch}^{**} = \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(a_{\pi}\right)\right]$ is strictly superior to $C_{si}^{**} = \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}_{si}^{**}\right)\right]$, for all $\gamma > \gamma_{sr}$. Indeed, *CSR exacerbates the ceiling inefficiency and the contribution inefficiency* that would prevail with a self-interested worker only, by $(1-\gamma)\left[S\left(\overline{a}_{ch}^{**}(\gamma)\right) - S\left(\overline{a}_{si}^{**}(\gamma)\right)\right]$ and $(1-\gamma)\left[C_{ch}^{**}(\gamma) - C_{si}^{**}(\gamma)\right]$, respectively. These two welfare costs of CSR simplify to $\frac{1-\gamma}{\gamma}\left[S\left(\overline{a}_{si}^{**}(\gamma)\right) - S\left(a_{\pi}\right)\right]$, as represented in the third line of (29).

A careful examination of expression (29) yields several key insights. First, when γ tends to γ_{sr} from above, the welfare impact of social responsibility is unambiguously negative. To see this, note from Figures 1 and 3 that around γ_{sr} the action chosen if only the self-interested employee is available is $a_{si} = \overline{a}_{si}^{**} = a_{sr}^{u}$. In other words, the action chosen in equilibrium is identical to the one that would be chosen if the socially responsible worker were available

[15] To see this, recall that $a_{si} = \overline{a}_{si}^{**}$, and hence that $\pi\prime\left(a_{si}\right) + \frac{1-\gamma}{\gamma} S\prime\left(a_{si}\right) = 0$. Define $Z(.) = \pi(.) + \rho\left[S(.) - S\left(a_{\pi}\right)\right]$ as the firm's net payoff at date 1 with the socially responsible sr employee. Now consider marginal payoff $Z\prime(.)$, evaluated at a_{si}: $Z\prime\left(a_{si}\right) = \pi\prime\left(a_{si}\right) + \rho S\prime\left(a_{si}\right)$. Substituting $\pi\prime\left(a_{si}\right) = -\frac{1-\gamma}{\gamma} S\prime\left(a_{si}\right)$ into $Z\left(a_{si}\right)$ yields $Z'\left(a_{si}\right) = \left(\rho - \frac{1-\gamma}{\gamma}\right) S\prime\left(a_{si}\right) < 0$ for all $\gamma > \gamma_{sr}$. By the strict concavity of payoff $Z(.)$, we must have $a_{sr} < a_{si}$ in order to ensure that $\pi\prime\left(a_{sr}\right) + \rho S\prime\left(a_{sr}\right) = 0$.

in the labor market. Accordingly, the welfare benefit from social responsibility collapses to $(1+\rho)\left[S\left(a_{sr}^{u}\right)-S\left(a_{sr}^{u}\right)\right]=0$ when $\gamma\rightarrow\gamma_{sr}^{+}$. Conversely, the welfare cost of social responsibility is maximized when $\gamma\rightarrow\gamma_{sr}^{+}$, converging toward $\frac{1-\gamma_{sr}^{+}}{\gamma_{sr}^{+}}\left[S\left(a_{sr}^{u}\right)-S\left(a_{\pi}\right)\right]$.

Second, when γ tends to 1 (perfectly inefficient government), the welfare impact of social responsibility is unambiguously positive. Considering Figures 1 and 3 again, it is clear that as $\gamma\rightarrow1$, the regulatory ceiling chosen with purely self-interested employees is $\overline{a}_{si}^{**}\rightarrow a_{\pi}$. In other words, the ceiling chosen, and hence the political contribution made to the government is identical to the one that would be made if the socially responsible were available in the labor market. Accordingly, the welfare cost of social responsibility collapses to $\frac{1-\gamma}{\gamma}\left[S\left(a_{\pi}\right)-S\left(a_{\pi}\right)\right]=0$ when $\gamma\rightarrow1$. Conversely, the welfare benefit from social responsibility is maximized when $\gamma\rightarrow1$, converging toward $(1+\rho)\left[S\left(a_{sr}^{u}\right)-S\left(a_{\pi}\right)\right]$.

More generally, note from Figures 1 and 3 that for all $\gamma\in(\gamma_{sr},1)$, equilibrium regulatory ceiling and managerial action when the sr worker is available are independent of γ: $\overline{a}_{ch}^{**}(\gamma)=a_{\pi}$ and $a_{sr}=a_{sr}^{u}$. In contrast, the ceiling chosen when only the si worker is available, $\overline{a}_{si}^{**}(\gamma)<a_{\pi}$, is strictly increasing in government inefficiency γ, thus gradually coming closer to $\overline{a}_{ch}^{**}(\gamma)$, and hence reducing the social cost of social responsibility. In addition, the managerial action chosen in that case, $a_{si}=\overline{a}_{si}^{**}(\gamma)>a_{sr}^{u}$, is also strictly increasing in γ, thus gradually getting further away from a_{sr}, and hence increasing the social benefit from social responsibility. Indeed, as shown formally in the appendix, government inefficiency does increase the net welfare benefits from social responsibility, and there exists a threshold level of government inefficiency $\gamma_{sr}'\in(\gamma_{sr},1)$ such that for all $\gamma\in(\gamma_{sr},\gamma_{sr}']$ the availability of a sr worker in the labor market has a negative impact on social welfare; and for all $\gamma\in(\gamma_{sr}',1)$, it has a positive impact on social welfare.

We illustrate these results in Figure 4, and summarize them in the proposition below.

[INSERT FIGURE 4 ABOUT HERE]

Proposition 6 *When the government is relatively efficient ($\gamma\leq\gamma_{sr}$), having access to a socially responsible worker in addition to a self-interested worker has no impact on social welfare. When the government is moderately inefficient ($\gamma\in(\gamma_{sr},\gamma_{sr}')$), access to a socially responsible worker has a negative welfare impact. When the government is very inefficient ($\gamma\in[\gamma_{sr}',1)$), access to a socially responsible worker has a positive welfare impact.*

Other comparative statics behind these results are interesting and point us again back to Friedman (1963). Note that the more socially responsible the *sr* worker - i.e. the higher the worker's ρ - the lower the threshold γ_{sr}, and hence the larger the region $[\gamma_{sr}, 1)$ over which having access to the *sr* worker is beneficial.

Conversely, if the preference for social responsibility is low in the economy, then the corresponding value of ρ will be low. This will cause the critical threshold γ_{sr} to approach 1, which as shown in Firgure 3 means that the region will shrink over which the firm lobbies for inefficient regulation and absorbs the surplus through contractual means. This point is relevant because it harkens back to the analysis provided by Friedman (1963): a necessary condition for firms to engage in regulatory capture is that there is a sufficient aggregate preference for social responsibility.

4.4 Calibrating the Model

Before we proceed to considering several extensions to the model, it is worth discussing the relevant empirical calibrations that are implicitly assumed in our analysis, because the empirical relevance of our model hinges on a comparison between the costs of lobbying and the gains from CSR.

First, the empirical evidence suggests that lobbying costs are actually quite small as a fraction of firm value, so it is easy to imagine that they are an order of magnitude below the social responsibility rent extraction that occurs. In particular, resources like Opensecrets.org, which tracks political contributions in the United States, suggest that firms' lobbying costs are only a tiny fraction of their overall profits. For example, the top insurance company, in terms of lobbying, in 2012 was Blue Cross/Blue Shield, which paid a little over $6 million in lobbying costs. Total lobbying contributions by all firms in the finance sector were $500 million in that year. General Motors spends around $10 million per year in lobbying costs.

These anecdotes comport with a large body of empirical evidence on the magnitudes of political contributions, lobbying and their associated returns. Ansolabehere et al (2003) document the fact that influence payments in the form of campaign contributions seem rather modest; Milyo et al. (2000) shows that lobbying expenses are about ten times larger than all other forms of political contributions, but argues that indeed the dollars that flow into lobbying are small relative to the political returns from lobbying. de Figueiredo and Silverman (2006) show that the returns to lobbying for earmarks are on the order of $10 for every $1 of lobbying expenses.

A second question is whether is whether the simultaneous pursuit of lobbying and CSR is an empirical regularity. Richter (2011) finds that CSR activity and corporate lobbying are commonly observed in the same firms. He finds that about 28% of firms on the KLD database (a widely used database for social responsibility research) also engage in lobbying, based on data from the Center for Responsive Politics. He documents the fact that on average, firms that do both have higher Tobin's q than firms that do only one or the other. This is broadly consistent with the predictions of our model, but as we discuss below, whether the social responsibility wedge is reflected in equity prices hinges critically on the nature of the CSR activity and the ability to pledge it to the owners of the firm.

In sum, therefore, the existing empirical evidence suggests that the mechanisms we highlight in our theoretical analysis are not only plausible, they are likely. Indeed, the data on corporate political action and CSR suggest that many firms engage in both types of activities simultaneously, and that it is easy to imagine that the financial or non-pecuniary gains experienced by corporations would far outstrip their associated lobbying costs.

5 Interpretations and Extensions

The model presented thus far is intentionally stark to stress its main insights. In particular, we have suppressed any discussion to this point of whether workers and citizens are one and the same, as well as any agency considerations arising from disbursed ownership of the firm and whether the social responsibility wedge created through judicious lobbying is shared among different stakeholders of the firm. We take up these issues in this section and explore a number of other interpretations based on related but distinct organizational arrangements that relate to our main analysis.

5.1 Outside Equity and Managerial Agency

5.1.1 Citizens as Shareholders

Another natural question that arises in the analysis of our model is what would happen if we allowed citizens to instead be shareholders of the firm that is choosing to engage in social responsibility. There are two distinct issues that arise here. One is that their ownership of the firm may partly compensate them for the utility loss associated with the firm's production activities, effectively narrowing the wedge between what is privately optimal for the firm and what is socially optimal.

In the main analysis of the model, there is no distinction between the two alternative sources of firm value: profits associated with production ($\pi(a)$ in the analysis) and rents that accrue to the firm associated with allowing a socially responsible worker to take a less socially destructive action. No such distinction is required because the main analysis is not concerned with how the rents and profits are shared between the firm and its owners. In the simplest possible formulation, allowing citizens to be owners of the firm would effectively lower the cost of the negative spillovers that citizens experience, narrowing the distance between a_π and a^*. Under this formulation, none of the model's results would change as long as outside shareholders do not own 100% of the firm.

5.1.2 Can CSR Rents Be Pledged to Outsiders?

A more interesting case arises when the pledgability of production profits and social responsibility rents differs. At one extreme, consider the case in which the profits associated with production can be fully pledged to outside shareholders, while the rents extracted from socially responsible agents are purely captured by the firm's managers. If this is the case, then shareholders are strictly worse off under socially responsible than under pure self-interest: they receive a fraction of $\pi(a^*_{si})$ in the latter case but a fraction of $\pi(a^*_{sr}) < \pi(a^*_{si})$ in the former case. Thus, under this formulation, pursuing CSR destroys shareholder value.

This version of the model delivers the exact predictions tested in recent empirical work by Cheng, Hong and Shue (2012). They use shocks to managerial ownership induced by dividend tax cuts, as well as regression discontinuities around close shareholder votes, to find that firms engage in less social responsibility when the level of agency problems inside the firm drops. That is, among firms in which effective managerial ownership increased as a result of the 2003 dividend tax cuts, CSR activity dropped. Likewise, CSR activity is lower in firms just above the 50% shareholder vote cutoff than just below it. Both these results square with a version of our model in which the rent extraction associated with CSR accrues to insiders, and is therefore inconsistent with shareholder value maximization.

Alternatively, if we assume that the rents from CSR activity can be pledged to outsiders, then outside shareholders have a stake not only on $\pi(a)$ but also on $P(a)$. At this opposite extreme, what is good for the firm is also good for its shareholders. Formulations along these lines are supported by work such as Edmans (2007), which shows that firms that behave responsibly towards employees earn higher abnormal returns.

More generally, our model stresses the fact that the welfare implications to shareholders of CSR are not straightforward, but depend on whether the socially responsible actions flow through to the net profits of the firm or are dissipated as private benefits inside the firm. While ultimately it may be an empirical question as to which scenario dominates, the same basic incentive structures between firms, the government and other stakeholders give rise to either set of predictions.

5.2 Contrasting Social Entrepreneurship and CSR

The welfare implications of our model hinge critically on whether or not the CSR that we observe has been purchased through inefficient regulation. In our analysis, we have considered a situation in which a firm can lobby for inefficient regulation, then partly capture the rents associated with the provision of social welfare. This balance between the deadweight cost of inefficient regulation and social welfare creation associated with CSR is precisely what poses difficulties for the welfare analysis.

What if instead firms were too small to have an effect on government behavior? If government is exogenously inefficient, then it is straightforward to see from our analysis that CSR is unambiguously welfare increasing. In other words, if we simply fix an exogenously specified level of government inefficiency and contrast social welfare before and after the introduction of CSR, the welfare implications are clear.

This invites a broader discussion of alternative types of corporate social behavior. In particular, social entrepreneurship—the phenomenon in which entrepreneurial startups focus solely or partly on social, non-profit objectives—has emerged in tandem with CSR as another mode of corporate social behavior. Given the limited ability of small entrepreneurial organizations to be implicated in setting the equilibrium level of the inefficiency to which they respond, our model suggests that firm size is related to the welfare consequences of social responsibility. Our model predicts that social firms—those who operate small-scale organizations aimed at alleviating social ills, but with a profit motive—are much more likely to be welfare increasing for society as a whole than CSR initiatives undertaken by large organizations that could reasonably be expected to affect the equilibrium behavior of regulatory institutions.

5.3 A Social Venture Capital Interpretation of the Model

An alternative interpretation of our model is in terms of the relationship between a social entrepreneur and her source of funding. In particular, by recasting the firm/worker relationship in our model as a relationship between a venture capitalist (VC) and a social entrepreneur, our model offers predictions about the nature of their funding relationship. Under this formulation of the model, the firm is a venture capital organization that funds startups, and a worker of a particular type is an entrepreneur seeking funding.

For instance, assume that two identical entrepreneurs seek outside funding to start their firms. One venture focuses solely on maximizing profits, while the second venture operates in the same sector but pursues a "multi-stakeholder" approach and trades off profit maximization against other objectives like worker happiness and socially responsible supply chains. That is, the self-interested venture intends to operates their business plan in a profit maximizing way while the socially responsible venture operates a similar business model but trades off monetary profits for social considerations.

Our model predicts that the social entrepreneur will bear the entire cost of deviating from profit maximization. More precisely, our model predicts that the VC, acting as principal, will allow the socially responsible firm to operate their business plan according to a multi-stakeholder approach, but in doing so will extract more concessions from them such that their expected returns are at least as high as they would be if they only funded profit maximizing firms. In the eyes of the social entrepreneur, the VC appears to claim that they intend to fund socially minded startups, but they make the startup bear the cost of the social benefits in the form of lower valuations.

5.4 An Organizational Economics Interpretation of the Model

Suppose that instead of lobbying the government, the firm could make an ex ante investment in organizational flexibility, where flexibibility is defined as the maximum value $\overline{a}$ that action $a \in [0, \overline{a}]$ can take. Moreover, suppose that the cost of such an investment organizational flexibility were $K(\overline{a}) = \frac{1-\gamma}{\gamma} k(\overline{a})$, with $k'(.) > 0$ and $k''(.) > 0$.

In this context, parameter γ could be interpreted as the firm's inherent ability to change: the larger γ, the lower the marginal cost of increasing organizational flexibility. All of the results of our model would then take on an organizational economics interpretation in that case. Indeed for firms with low inherent ability to change (low γ), it is too costly to invest in organizational flexibility, and without it the availability of a *sr* worker would have no impact on the firm's hiring strategy and expected profits. On the other hand, firms with high inherent ability to change (high γ), it may be optimal to invest in great organizational flexibility, i.e. in a high value of $\overline{a}$, in order to endogenously create a social responsibility wedge for the *sr* worker, and which can be extract from him through lower wages. Thus, under this interpretation of the model, social responsibility is in a way complementary to firms' inherent ability to change.

6 Conclusion

As Benabou and Tirole (2010) note, "Society's demands for individual and corporate social responsibility as an alternative response to market and distributive failures are becoming increasingly prominent." We address two issues in this paper that are directly connected to this observation. First, we derive conditions under which CSR arises endogenously as a response to other economic forces. In this respect, our analysis offers a positive theory of CSR. Second, we ask whether society's increased demands for such behavior are welfare improving. In this respect, it offers a normative theory of CSR.

Although our analysis shows how CSR can emerge as an equilibrium response to a government that strays from the objective of social welfare maximization, our model makes it clear that it is far from obvious that this is good for society as a whole. In a narrow sense, the emergence of CSR raises social welfare relative to what would obtain under a similar degree of regulatory inefficiency. But the ability to capture economic rents associated with CSR can create an incentive for firms to engage in socially wasteful influence behavior that effects the equilibrium regulatory behavior of the government in the first place. This concern is captured in sentiments expressed by observers like former United Nations Secretary General Kofi Annan, writing "Business must restrain itself from taking away, by its lobbying activities, what it offers through corporate responsibility..." (The Global Compact, 2005). Comments like this stress the dark side to CSR even in a setting in which, all else equal, society is seemingly better off with it than without it.

In that sense, the tension in our model is related to what is sometimes referred to as the cobra effect.[16] Holding constant the amount of inefficient regulation, introducing CSR may be welfare improving, but at the same time the CSR movement itself may create broader social forces that divert resources away from institutions that would otherwise promote the adoption of efficient regulation.

To keep the analysis simple, our model casts CSR as an unambiguously pro-social corporate behavior; however, our results generalize to settings in which CSR may be a form of catering to certain special interest groups. It is possible to recast our model as one in which alternative interest groups, some of whom want one thing and some another, compete for social action through the corporate sector instead of through political channels. In this broader sense firms can be seen as using political influence to purchase a right that they then give away to a special interest group in exchange for some surplus that they capture from that group. Governments in our model do this because there is no mechanism by which citizens can pay them directly.

In that regard, our analysis is both an explication and a critique of Friedman's original analysis. His concern was that social responsibility causes business to become "unwitting puppets of the intellectual forces that have been undermining the basis of a free society these past decades" (Friedman, 1970). Our model illustrates how CSR, when viewed as a form of corporate self-policing, can create incentives that undermine the quality of oversight. But in our analysis, the concern is not that businesses are unwitting puppets of broader social forces, but rather that they are willful puppet masters exploiting broader social forces. Regardless of whether exploiting these forces benefits shareholders or is purely a form of managerial agency, the mere presence of CSR cannot be viewed as a benefit or a cost without a careful examination of the root causes of the underlying inefficiencies that give rise to its prevalence in the first place.

[16]Allegedly the British rulers of India, frustrated by the great number of cobras in the area, offered a reward for every cobra carcass brought to the authorities. The reward created a thriving market for the farming of baby cobras. Upon learning that their policies had backfired, the reward was banished, which in turn caused scores of baby cobras, now worthless, to be released, greatly exacerbating the problem.

A Appendix: Proofs

The proofs of Lemmas 1 and 2; and of Propositions 1, 2, 3, 4 and 5 follow directly from the text, and are omitted here.

A.1 Proof of Lemma 3

Recall from (21) that the firm's program at date 0 simplifies to maximizing U_{si} with respect to $\overline{a}$, with:

$$U_{si} = \pi\left(\overline{a}\right) - \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right].$$

Clearly, U_{si} is strictly concave in $\overline{a}$, since it is a linear combination of $\pi\left(\overline{a}\right)$ and $S\left(\overline{a}\right)$ which are both strictly concave. There is thus a unique $\overline{a} = \overline{a}_{si}^{**}$ that maximizes U_{si} such that: $U'\left(\overline{a}_{si}^{**}\right) = \pi'\left(\overline{a}_{si}^{**}\right) + \frac{1-\gamma}{\gamma}S'\left(\overline{a}_{si}^{**}\right) = 0$.

Proof that $\overline{a}_{si}^{**} \in \left(a^{*}, a_{\pi}\right)$. Since $\pi'\left(a^{*}\right) > 0$ and $S'\left(a^{*}\right) = 0$, and $\pi'\left(a_{\pi}\right) = 0$ and $S'\left(a_{\pi}\right) < 0$, we must have $U'\left(a^{*}\right) > 0$ and $U'\left(a_{\pi}\right) < 0$. By the strict concavity of U_{si}, it must be that $\overline{a}_{si}^{**} \in \left(a^{*}, a_{\pi}\right)$.

Proof that $d\overline{a}_{si}^{**}/d\gamma > 0$. Using the implicit function theorem, we can write:

$$\frac{d\overline{a}_{si}^{**}}{d\gamma} = -\frac{\partial U'/\partial\gamma}{\partial U'/\partial\overline{a}_{si}^{**}} = \frac{S'\left(.\right)}{\gamma^{2}\left(\pi''\left(.\right) + \frac{1-\gamma}{\gamma}S''\left(.\right)\right)}.$$

By the strict concavity of U_{si}, we have $\pi''\left(.\right) + \frac{1-\gamma}{\gamma}S''\left(.\right) < 0$. Since $S'\left(a\right) < 0$ for all $a > a^{*}$, and $\overline{a}_{si}^{**} > a^{*}$, we must have $S'\left(\overline{a}_{si}^{**}\right) < 0$. These results then immediately imply $d\overline{a}_{si}^{**}/d\gamma > 0$.

The other results of Lemma 3 follow directly from the text. □

A.2 Proof of Lemma 4

Recall from the main text that $\gamma_{sr} = 1/\left(1+\rho\right)$. Let us define U_{ch} as the firm's payoff from a date 0 viewpoint:

$$U_{ch} = \left\{\begin{array}{lll} \pi\left(\overline{a}\right) - \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in \left[0, a_{sr}^{u}\right] \\ \pi\left(a_{sr}^{u}\right) + \rho\left[S\left(a_{sr}^{u}\right) - S\left(\overline{a}\right)\right] - \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in \left(a_{sr}^{u}, a_{\pi}\right] \\ \pi\left(a_{sr}^{u}\right) + \rho\left[S\left(a_{sr}^{u}\right) - S\left(a_{\pi}\right)\right] - \frac{1-\gamma}{\gamma}\left[S\left(a^{*}\right) - S\left(\overline{a}\right)\right] & \text{if} & \overline{a} \in \left(a_{\pi}, +\infty\right) \end{array}\right\}. \quad (29)$$

Note from (30) that U_{ch} is continuous for all $\overline{a} \in \mathbb{R}_{+}$. We prove Lemma 4 in several steps.

Proof that $\overline{a}_{ch}^{**} \leq a_\pi$ for all $\gamma \in (0,1)$. Note from (30) that $\frac{dU_{ch}}{d\overline{a}} = \frac{1-\gamma}{\gamma} S'(\overline{a}) < 0$ for all $\overline{a} \in (a_\pi, +\infty)$. Hence if a solution $\overline{a}_{ch}^{**}$ exists to the maximization of U_{ch}, it must be such that $\overline{a}_{ch}^{**} \leq a_\pi$.

Let $\gamma < \gamma_{sr}$. Consider the region where $\overline{a} \in (a_{sr}^u, a_\pi]$. In this region, $\frac{dU_{ch}}{d\overline{a}} = -\left[\rho - \frac{1-\gamma}{\gamma}\right] S'(\overline{a})$. Clearly $\gamma < \gamma_{sr}$ if and only if $\rho < \frac{1-\gamma}{\gamma}$, which in turn implies $\frac{dU_{ch}}{d\overline{a}} < 0$ for all $\overline{a} \in (a_{sr}^u, a_\pi]$. Hence if a solution $\overline{a}_{sr}^{**}$ exists to the maximization of U_{ch}, it must be such that $\overline{a}_{ch}^{**} \leq a_{sr}^u$.

Let us define $U_{ch1} = \pi(\overline{a}) - \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a})]$. As discussed in the proof of Lemma 3, $U_{ch1} \equiv U_{si}$ is strictly concave in $\overline{a}$. There is thus a unique $\overline{a} = \overline{a}_{ch}^{**}$ that maximizes U_{ch1} such that:

$$\pi'(\overline{a}_{ch}^{**}) + \frac{1-\gamma}{\gamma} S'(\overline{a}_{ch}^{**}) = 0. \tag{30}$$

Since $\pi'(a^*) > 0$ and $S'(a^*) = 0$, by the strict concavity of U_{ch1} we know that $\overline{a}_{ch}^{**} > a^*$. Moreover, recall from (14) that $\pi'(a_{sr}^u) + \rho S'(a_{sr}^u) = 0$. Since $\rho < \frac{1-\gamma}{\gamma}$, this implies $\pi'(a_{sr}^u) + \frac{1-\gamma}{\gamma} S'(a_{sr}^u) < 0$, which in turn, by the strict concavity of U_{ch1}, yields $\overline{a}_{ch}^{**} < a_{sr}^u$. Thus, when $\gamma < \gamma_{sr}$, there exists a unique regulatory ceiling $\overline{a}_{ch}^{**} \in (a^*, a_{sr}^u)$ that maximizes the firm's date 0 payoff U_{ch}.

Note that $\frac{d\overline{a}_{ch}^{**}}{d\gamma} > 0$ for all $\gamma < \gamma_{sr}$. To see this, consider expression (31). Using the implicit function theorem, we can write $\frac{d\overline{a}_{ch}^{**}}{d\gamma} = \frac{(1/\gamma^2) S'(.)}{\pi'(.) + \frac{1-\gamma}{\gamma} S'(.)} > 0$ by the strict concavity of U_{ch1}.

Let $\gamma = \gamma_{sr}$. It follows directly from the previous case that when $\gamma = \gamma_{sr}$, $U_{ch}(\overline{a}) = U_{ch}(a_{sr}^u)$ for all $\overline{a} \in [a_{sr}^u, a_\pi]$ and that $\arg\max U_{ch}(\overline{a}) = [a_{sr}^u, a_\pi]$. Indeed, there is a multiplicity of equilibria in that case, all yielding the same payoff. By convention, we assume that the pareto optimal solution is chosen in that case, which corresponds to the lowest value among the feasible equilibria: $\overline{a}_{ch}^{**} = a_{sr}^u$. This is the pareto optimal equilibrium because it involves the lowest regularity ceiling and hence the lowest level of a in equilibrium, and the lowest level of potentially inefficient influence payments $C_{ch}^{**}(\gamma) = \frac{1-\gamma}{\gamma}[S(a^*) - S(a_{sr}^u)]$.

Let $\gamma > \gamma_{sr}$. Consider the region where $\overline{a} \in (a_{sr}^u, a_\pi]$. In this region, $\frac{dU_{ch}}{d\overline{a}} = -\left[\rho - \frac{1-\gamma}{\gamma}\right] S'(\overline{a})$. Since $\gamma > \gamma_{sr}$ if and only if $\rho > \frac{1-\gamma}{\gamma}$, we must have $\frac{dU_{ch}}{d\overline{a}} > 0$ for all $\overline{a} \in (a_{sr}^u, a_\pi]$. Hence the value of $\overline{a} \in (a_{sr}^u, a_\pi]$ that maximizes U_{ch} over that region is a_π.

Now consider the region where $\overline{a} \in [0, a_{sr}^u]$. Since as discussed above $\pi'(a_{sr}^u) + \rho S'(a_{sr}^u) = 0$, and since $\rho > \frac{1-\gamma}{\gamma}$, it must be that $\pi'(a_{sr}^u) + \frac{1-\gamma}{\gamma} S'(a_{sr}^u) > 0$. The strict concavity of U_{ch1} then implies $\pi'(\overline{a}) + \frac{1-\gamma}{\gamma} S'(\overline{a}) > 0$ for all $\overline{a} \in [0, a_{sr}^u]$. Hence the value of $\overline{a} \in [0, a_{sr}^u]$ that maximizes U_{ch} over that region is a_{sr}^u.

Since U_{ch} is continuous for all $\overline{a} \in \mathbb{R}_+$, and since $\frac{dU_{ch}}{d\overline{a}} > 0$ for all $\overline{a} \in (a_{sr}^u, a_\pi]$, it must be that $U_{ch}(a_\pi) > U_{ch}(a_{sr}^u)$. Thus, when $\gamma > \gamma_{sr}$, there exists a unique regulatory ceiling $\overline{a}_{ch}^{**} = a_\pi$ that maximizes the firm's date 0 payoff U_{ch}.

In sum, in the foregoing proof we have shown the following results about the equilibrium regulatory ceiling:

$$\begin{array}{ll} \overline{a}_{ch}^{**} \in (a^*, a_{sr}^u], \text{ with } \frac{d\overline{a}_{ch}^{**}}{d\gamma} > 0 & \text{for all } \gamma \in (0, \gamma_{sr}]\,; \\ \overline{a}_{ch}^{**} = a_\pi & \text{for all } \gamma \in (\gamma_{sr}, 1)\,. \end{array}$$

The proof of the other elements of Lemma 4 follows directly from the text and is omitted here. □

A.3 Proof of Proposition 6

We consider two scenarios in turn.

Case where $\gamma \in (0, \gamma_{sr}]$. As shown in the main text, regulatory ceilings and managerial actions are the same whether or not a *sr* worker is available: $\overline{a}_{si}^{**}(\gamma) = \overline{a}_{ch}^{**}(\gamma)$, $a_{si} = a_{ch}$. As a result social welfare is the same in both cases: $TS_2(\overline{a}_{ch}^{**}(\gamma), C_{ch}^{**}(\gamma)) = TS_2(\overline{a}_{si}^{**}(\gamma), C_{si}^{**}(\gamma))$ and $\Delta TS_2(\gamma) = 0$ for all $\gamma \leq \gamma_{sr}$.

Case where $\gamma \in (\gamma_{sr}, 1)$. Consider again expression (29) describing the welfare impact of social responsibility:

$$\Delta TS_2(\gamma) = (1+\rho)\left[S(a_{sr}^u) - S(\overline{a}_{si}^{**}(\gamma))\right] - \frac{1-\gamma}{\gamma}\left[S(\overline{a}_{si}^{**}(\gamma)) - S(a_\pi)\right]. \tag{31}$$

It is easy to verify from the main text and from Figure 3 that:

$$\begin{array}{llllll} \lim\limits_{\gamma \to \gamma_{sr}^+} \overline{a}_{si}^{**}(\gamma) = & a_{sr}^u, & \text{hence} & \lim\limits_{\gamma \to \gamma_{sr}^+} \Delta TS_2(\gamma) = & -\frac{1-\gamma}{\gamma}\left[S(a_{sr}^u) - S(a_\pi)\right] & < 0 \\ \text{and} & & & & & \\ \lim\limits_{\gamma \to 1} \overline{a}_{si}^{**}(\gamma) = & a_\pi, & \text{hence} & \lim\limits_{\gamma \to 1} \Delta TS_2(\gamma) = & (1+\rho)\left[S(a_{sr}^u) - S(a_\pi)\right] & > 0 \end{array} \tag{32}$$

Note that $\overline{a}_{si}^{**}(\gamma)$ is continuous in γ for all $\gamma \in (\gamma_{sr}, 1)$. Since function $S(.)$ is continuous by assumption, then $\Delta TS_2(\gamma)$ must be continuous for all $\gamma \in (\gamma_{sr}, 1)$.

Differentiating $\Delta TS_2(\gamma)$ with respect to γ, we get:

$$\begin{aligned} \tfrac{d\Delta TS_2(\gamma)}{d\gamma} = & -(1+\rho)\tfrac{\partial S\left(\overline{a}_{si}^{**}\right)}{\partial \overline{a}_{si}^{**}}\tfrac{\partial \overline{a}_{si}^{**}}{\partial \gamma} \\ & + \tfrac{1}{\gamma^2}\left[S\left(\overline{a}_{si}^{**}(\gamma)\right) - S(a_\pi)\right] - \tfrac{(1-\gamma)}{\gamma}\tfrac{\partial S\left(\overline{a}_{si}^{**}\right)}{\partial \overline{a}_{si}^{**}}\tfrac{\partial \overline{a}_{si}^{**}}{\partial \gamma}. \end{aligned} \tag{33}$$

It is clear from the main text and from Figure 3 that $\partial \overline{a}_{si}^{**}/\partial\gamma > 0$. That $\partial S\left(\overline{a}_{si}^{**}\right)/\partial \overline{a}_{si}^{**} < 0$ follows directly from the strict concavity of $S(.)$, and the facts that it is maximized at a^* and that $\overline{a}_{si}^{**} > a^*$. Together with the result that $\overline{a}_{si}^{**}(\gamma) < a_\pi$ implies $S\left(\overline{a}_{si}^{**}(\gamma)\right) > S(a_\pi)$, this yields $d\Delta TS_2(\gamma)/d\gamma > 0$.

This result in turn, together with the continuity of $\Delta TS_2(\gamma)$ and the results that $\lim_{\gamma\to\gamma_{sr}^+} \Delta TS_2(\gamma) < 0$ and $\lim_{\gamma\to 1}\Delta TS_2(\gamma) > 0$, imply that there exists a unique $\gamma'_{sr} \in (\gamma_{sr}, 1)$ such that $\Delta TS_2(\gamma) < 0$ for all $\gamma \in (\gamma_{sr}, \gamma'_{sr})$ and $\Delta TS_2(\gamma) \geq 0$ for all $\gamma \in [\gamma'_{sr}, 1)$. $\square$

B Robustness Considerations

While our main arguments are developed with the simplest model possible, in this section we consider a number of extensions to show that our main analysis is robust to a number of technical considerations: these are limited liability, non-contractibility and asymmetric information.

B.1 Limited Managerial Liability

In this appendix, we examine the scenario in which where managers have limited wealth $w_0 \in \mathbb{R}_{++}$. We show that the results of the main model remain very similar under this assumption. As in the main model, we determine the equilibrium by backward induction.

B.1.1 Hiring the si Manager

Clearly when si worker is hired, nothing changes in our model: the firm continues to pay the worker $W_{si} = 0$; the action a_{si} that it asks the worker to select remains determined by (7); and its payoff as a function of regulatory ceiling $\overline{a}$, $P_{si}(\overline{a})$, is still determined by (8).

B.1.2 Hiring the sr Manager

Let us now examine the case in which a wealth-constrained sr worker is hired. As in the main model, we consider first the "government-unconstrained" scenario in which no regulatory ceiling is constraining the action requested by the firm from the sr worker. Similar to the main model, the firm's program involves choosing managerial action $\widehat{a}$, base salary w_{ll}, and bonus b_{ll} to maximize its program $\pi(\widehat{a}) - (w_{ll} + b_{ll})$, subject to the IC constraint $b_{ll} + \rho S(\widehat{a}) \geq \rho S(a^*)$, and to the IR constraint $w_{ll} + b_{ll} + \rho S(\widehat{a}) \geq \rho S(a_{si})$. We denote the worker's total compensation $W_{ll} = w_{ll} + b_{ll}$.

The main difference with the main model is that the firm faces an additional constraint - the worker's limited liability (LL) constraint: $w_{ll} + b_{ll} \geq -w_0$. Indeed, the IR and LL constraints can be merged into one constraint expressed as:

$$w_{ll} + b_{ll} \geq \max\{-\rho[S(\widehat{a}) - S(a_{si})]; -w_0\}. \tag{34}$$

Thus we can express the firm's "government-unconstrained" maximization program in a simplified way as follows:

$$\max_{\widehat{a}} \quad \pi(\widehat{a}) + \min\{\rho[S(\widehat{a}) - S(a_{si})]; w_0\}, \tag{35}$$

with $a_{si} = \overline{a}$ if $\overline{a} \leq a_\pi$, and $a_{si} = a_\pi$ if $\overline{a} > a_\pi$.

It follows directly from constraint (35) and from the analysis of the main model that when $w_0 \geq \rho \left[S\left(a_{sr}^u\right) - S\left(a_\pi\right)\right]$, the LL constraint is never binding. This is because the agent's wealth w_0 is greater than the maximum social responsibility wedge $\rho \left[S\left(a_{sr}^u\right) - S\left(a_\pi\right)\right]$ that the firm may wish to extract from him. Thus in that case the results remain exactly as in the main model. To keep the analysis interesting in this appendix, we impose the following parametric restriction:

$$w_0 \in \left(0, \rho \left[S\left(a_{sr}^u\right) - S\left(a_\pi\right)\right]\right). \tag{36}$$

To simplify the analysis going forward, let us define the following variable and function. First, we define $\overline{a}_1$ as the value of the regulatory ceiling $\overline{a}$ such that $\rho \left[S\left(a_{sr}^u\right) - S\left(\overline{a}_1\right)\right] = w_0$. We also define $\widehat{a}_{ll}\left(\overline{a}\right) = f\left(\overline{a}\right)$ as the value of the selected managerial action $\widehat{a}$ such that, for any given regulatory ceiling $\overline{a}$, $\rho \left[S\left(\widehat{a}_{ll}\right) - S\left(\overline{a}\right)\right] = w_0$, for all $\overline{a} > \overline{a}_1$. The implicit function theorem and the fact that $S'(.) < 0$ for all $a > a_\pi$ imply immediately that $f'\left(\overline{a}\right) > 0$ and $\widehat{a}_{ll}\left(\overline{a}\right) > a_{sr}^u$ for all $\overline{a} > \overline{a}_1$. Moreover, condition (37) implies $a_{sr}^u < \overline{a}_1 < a_\pi$ and $a_{sr}^u < \widehat{a}_{ll}\left(a_\pi\right) < a_\pi$.

In this and the following subsections we prove a series of results which will help determine the equilibrium of the game. The first result pertains the firm's optimal choice of action a_{ll} to be requested from the *sr* worker, as a function of the regulatory ceiling $\overline{a}$.

Result E1 *For a given regularity ceiling $\overline{a}$, the firm's optimal choice of action a_{ll} to be requested from the sr worker is:*

$$a_{ll}\left(\overline{a}\right) = \left\{ \begin{array}{lll} \overline{a} & \text{if} & \overline{a} \in \left[0, a_{sr}^u\right] \\ a_{sr}^u & \text{if} & \overline{a} \in \left(a_{sr}^u, \overline{a}_1\right] \\ \widehat{a}_{ll}\left(\overline{a}\right) & \text{if} & \overline{a} \in \left(\overline{a}_1, a_\pi\right] \\ \widehat{a}_{ll}\left(a_\pi\right) & \text{if} & \overline{a} \in \left(a_\pi, +\infty\right) \end{array} \right\}. \tag{37}$$

Proof of Result E1. *Let $\overline{a} \in \left[0, a_{sr}^u\right]$.* Then $a_{ll} = \overline{a}$ for the same reasons as in the main model: the ceiling is binding and there is no social responsibility wedge to extract from the worker.

Let $\overline{a} \in \left(a_{sr}^u, \overline{a}_1\right]$. Then $a_{ll} = a_{sr}^u$ for the same reasons as in the main model: setting $a_{ll} = a_{sr}^u$ allows the firm to extract social responsibility wedge $\rho \left[S\left(a_{sr}^u\right) - S\left(\overline{a}\right)\right]$ from the worker.

Let $\overline{a} \in \left(\overline{a}_1, a_\pi\right]$. Then $\rho \left[S\left(a_{sr}^u\right) - S\left(\overline{a}\right)\right] > w_0$, and the limited liability constraint is binding at $\widehat{a} = a_{sr}^u$. It follows directly from (36), and from the fact that $\pi'(.) > 0$ for all $\widehat{a} < a_\pi$ and

$\pi'(.) + \rho S'(.) < 0$ for all $\widehat{a} < a^u_{sr}$, that the optimal strategy for the firm is to raise the requested action $\widehat{a}$ to the point where $\rho [S(\widehat{a}) - S(\overline{a})] = w_0$, i.e. to $\widehat{a} = \widehat{a}_{ll}(\overline{a})$.

Let $\overline{a} \in (a_\pi, +\infty)$. Then $a_{si} = a_\pi$, and the firm's objective function can expressed as: $\pi(\widehat{a}) + \min\{\rho[S(\widehat{a}) - S(a_\pi)]; w_0\}$. Since $\rho[S(a^u_{sr}) - S(a_\pi)] > w_0$, the limited liability constraint is binding at $\widehat{a} = a^u_{sr}$. For the same reasons as in the case where $\overline{a} \in (\overline{a}_1, a_\pi]$, the optimal strategy for the firm is to raise the requested action $\widehat{a}$ to the point where $\rho[S(\widehat{a}) - S(a_\pi)] = w_0$, i.e. to $\widehat{a} = \widehat{a}_{ll}(\overline{a})$. □

We depict the firm's optimal action $a_{ll}(\overline{a})$ to be requested from the wealth-constrained *sr* worker, together with the optimal actions derived in the main model, in Figure 5.

[INSERT FIGURE 5 ABOUT HERE]

Note that when the regulatory ceiling $\overline{a} > \overline{a}_1$, we have $a_{ll}(\overline{a}) > a_{sr}(\overline{a})$, for the reasons provided in the proof of Result E1. When $\overline{a} > \overline{a}_1$, the limited liability constraint is binding at a^u_{sr}, and the firm will not be able to extract the entire social responsibility wedge $\rho[S(a^u_{sr}) - S(\overline{a})]$ from the worker, extracting instead only $w_0 < \rho[S(a^u_{sr}) - S(\overline{a})]$. By increasing the requested action from a^u_{sr} to $\widehat{a}_{ll}(\overline{a})$ such that $\rho[S(\widehat{a}_{ll}(\overline{a})) - S(\overline{a})] = w_0$, the firm continues to extract w_0 from the worker, but increases its profit from $\pi(a^u_{sr})$ to $\pi(\widehat{a}_{ll}(\overline{a}))$.

Result E2 *For a given regularity ceiling* $\overline{a}$*, the firm's equilibrium payoff* P_{ll} *if it hires the* sr *worker is:*

$$P_{ll}(\overline{a}) = \left\{ \begin{array}{ll} \pi(\overline{a}) & \text{if} \quad \overline{a} \in [0, a^u_{sr}] \\ \pi(a^u_{sr}) + \rho[S(a^u_{sr}) - S(\overline{a})] & \text{if} \quad \overline{a} \in (a^u_{sr}, \overline{a}_1] \\ \pi(\widehat{a}_{ll}(\overline{a})) + w_0 & \text{if} \quad \overline{a} \in (\overline{a}_1, a_\pi] \\ \pi(\widehat{a}_{ll}(a_\pi)) + w_0 & \text{if} \quad \overline{a} \in (a_\pi, +\infty) \end{array} \right\}. \tag{38}$$

Proof of Result E2. Follows directly from Result E1. □

We depict the firm's equilibrium payoff P_{ll} from hiring the wealth-constrained *sr* worker, together with the equilibrium payoff derived in the main model, in Figure 6.

[INSERT FIGURE 6 ABOUT HERE]

Note that when the regulatory ceiling $\overline{a} > \overline{a}_1$, we have $P_{ll}(\overline{a}) < P_{sr}(\overline{a})$. Beyond ceiling threshold $\overline{a}_1$, the worker's wealth constraint prevents the firm from extracting the entire social responsibility wedge from him, leading to a lower equilibrium payoff for the firm.

B.1.3 Optimal Hiring Choice as a Function of Regulatory Ceiling

Comparing payoffs $P_{si}(\overline{a})$ and $P_{ll}(\overline{a})$, defined in (8) and (39), respectively, it follows directly that:

$$\left\{\begin{array}{ll} \text{If } \overline{a} \in [0, a^u_{sr}]: & \text{The firm is indifferent betw. managers, requests action } \overline{a} \\ \text{If } \overline{a} \in (a^u_{sr}, +\infty): & \text{The firm hires } sr \text{ worker, requests action } a_{ll}(\overline{a}) \end{array}\right\}. \tag{39}$$

The logic behind this result is identical to that presented in the main text and is omitted here.

B.1.4 Regulatory Ceiling, Hiring and Actions in Equilibrium

Let us define $V(\overline{a})$ as follows:

$$\begin{aligned} V(\overline{a}) &= \pi(\widehat{a}_{ll}(\overline{a})) + \rho\left[S(\widehat{a}_{ll}(\overline{a})) - S(\overline{a})\right] - \frac{1-\gamma}{\gamma}\left[S(a^*) - S(\overline{a})\right] \\ &= \pi(\widehat{a}_{ll}(\overline{a})) + w_0 - \frac{1-\gamma}{\gamma}\left[S(a^*) - S(\overline{a})\right] \end{aligned} \tag{40}$$

For simplicity, we assume that $\pi(.)$ and $S(.)$ are such that $V(.)$ is strictly concave in $\overline{a}$.

Result E3 *Let us also define $\overline{a}_2(\gamma)$ as the value of regulatory ceiling $\overline{a}$ such that $dV(\overline{a})/d\overline{a} = 0$. Then $\overline{a}_2(\gamma)$ is strictly increasing in γ.*

Proof of Result E3. Differentiating $V(.)$ with respect to $\overline{a}$ yields:

$$\begin{aligned} \frac{dV}{d\overline{a}} &= \frac{\partial \pi}{\partial \widehat{a}_{ll}}\frac{\partial \widehat{a}_{ll}}{\partial \overline{a}} + \rho\left[\frac{\partial S}{\partial \widehat{a}_{ll}}\frac{\partial \widehat{a}_{ll}}{\partial \overline{a}} - \frac{\partial S}{\partial \overline{a}}\right] - \frac{1-\gamma}{\gamma}\frac{\partial S}{\partial \overline{a}} \\ &= \left[\left(\frac{\partial \pi}{\partial \widehat{a}_{ll}} + \rho\frac{\partial S}{\partial \widehat{a}_{ll}}\right)\frac{\partial \widehat{a}_{ll}}{\partial \overline{a}}\right] - \left[\rho\frac{\partial S}{\partial \overline{a}} - \frac{1-\gamma}{\gamma}\frac{\partial S}{\partial \overline{a}}\right]. \end{aligned} \tag{41}$$

Using the implicit function theorem, we can write $\frac{d\overline{a}_2}{d\gamma} = \frac{(1/\gamma^2)S'(.)}{d^2V/d\overline{a}^2} > 0$ by the strict concavity of $V(.)$. $\square$

Result E4 *Let us define ceiling thresholds γ_{ll} and γ_π such that $\overline{a}_2(\gamma_{ll}) = \overline{a}_1$ and $\overline{a}_2(\gamma_\pi) = a_\pi$. Then $\gamma_{sr} \leq \gamma_{ll} < \gamma_\pi < 1$.*

Proof of Result E4. *Showing that $\gamma_{sr} \leq \gamma_{ll}$.* Consider regulatory ceiling value γ_{sr}. By definition, γ_{sr} is such that $\rho = (1-\gamma_{sr})/\gamma_{sr}$, and hence the second square bracket on the right-hand side of (42) collapses to zero at γ_{sr}:

$$\frac{dV}{d\overline{a}} = \left(\frac{\partial \pi}{\partial \widehat{a}_{ll}} + \rho\frac{\partial S}{\partial \widehat{a}_{ll}}\right)\frac{\partial \widehat{a}_{ll}}{\partial \overline{a}} \quad \text{when } \gamma = \gamma_{sr}.$$

As shown above, $\widehat{a}_{ll}(\overline{a}) > a^u_{sr}$ for all $\overline{a} > \overline{a}_1$. Together with (14) and the strict concavity of $\pi(.) + \rho S(.)$, this implies $\frac{\partial \pi}{\partial \widehat{a}_{ll}} + \rho \frac{\partial S}{\partial \widehat{a}_{ll}} < 0$ for all $\overline{a} > \overline{a}_1$. We have also shown above that $\partial \widehat{a}_{ll}/\partial \overline{a} > 0$. Accordingly, when $\gamma = \gamma_{sr}$, $dV/d\overline{a} < 0$ for all $\overline{a} > \overline{a}_1$. By the strict concavity of $V(.)$ we must have $\overline{a}_2(\gamma_{sr}) \leq \overline{a}_1$, which implies $\overline{a}_2(\gamma_{sr}) \leq \overline{a}_2(\gamma_{ll})$. Result E3 then yields $\gamma_{sr} \leq \gamma_{ll}$.

Showing that $\gamma_{ll} < \gamma_\pi$. As discussed above, condition (37) implies $\overline{a}_1 < a_\pi$, which by definition implies $\overline{a}_2(\gamma_{ll}) < \overline{a}_2(\gamma_\pi)$. Result E3 then yields $\gamma_{ll} < \gamma_\pi$.

Showing that $\gamma_\pi < 1$. Note that $\lim\limits_{\gamma \to 1} dV/d\overline{a} = (\partial \pi / \partial \widehat{a}_{ll})(\partial \widehat{a}_{ll}/\partial \overline{a}) = 0$ iff $\partial \pi / \partial \widehat{a}_{ll} = 0$, iff $\widehat{a}_{ll}(\overline{a}) = a_\pi$. It then must follow that $\lim\limits_{\gamma \to 1} \overline{a}_2(\gamma) = f^{-1}(a_\pi)$ which is strictly superior to a_π by definition of $f(.)$: $\lim\limits_{\gamma \to 1} \overline{a}_2(\gamma) > a_\pi$. Result E3 then implies that there must exist a $\gamma_\pi < 1$ such that $\overline{a}_2(\gamma_\pi) > a_\pi$. □

Result E5 *The optimal regulatory ceiling* $\overline{a}^{**}_{ll}(\gamma)$ *lobbied by the firm at date 0 in exchange for political contribution* $C^{**}_{ll}(\gamma) = \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a}^{**}_{ll}(\gamma))]$, *can be expressed as follows as a function of government inefficiency* γ:

$$\overline{a}^{**}_{ll}(\gamma) = \left\{ \begin{array}{lll} \overline{a}^{**}_{ch}(\gamma) & \text{if} & \gamma \in (0, \gamma_{sr}] \\ \overline{a}_1 & \text{if} & \gamma \in (\gamma_{sr}, \gamma_{ll}] \\ \overline{a}_2(\gamma) & \text{if} & \gamma \in (\gamma_{ll}, \gamma_\pi] \\ a_\pi & \text{if} & \gamma \in (\gamma_\pi, 1) \end{array} \right\}.$$

Proof of Result E5. The firm's date 0 payoff can be expressed as $P_{ll}(\overline{a}) - C_{ll}$, with $P_{ll}(\overline{a})$ defined in (39) and subject to the government IR constraint $C_{ll} = \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a})]$. Substituting this IR constraint into the firm's objective function, we define U_{ll} as the firm's payoff from a date 0 viewpoint:

$$U_{ll} = \left\{ \begin{array}{ll} \pi(\overline{a}) - \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a})] & \text{if } \overline{a} \in [0, a^u_{sr}] \\ \pi(a^u_{sr}) + \rho[S(a^u_{sr}) - S(\overline{a})] - \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a})] & \text{if } \overline{a} \in (a^u_{sr}, \overline{a}_1] \\ \pi(\widehat{a}_{ll}(\overline{a})) + w_0 - \frac{1-\gamma}{\gamma}[S(a^*) - S(\overline{a})] & \text{if } \overline{a} \in (\overline{a}_1, a_\pi] \\ \pi(\widehat{a}_{ll}(a_\pi)) + w_0 - \frac{1-\gamma}{\gamma}[S(a^*) - S(a_\pi)] & \text{if } \overline{a} \in (a_\pi, +\infty) \end{array} \right\}. \quad (42)$$

Note from (43) that U_{ll} is continuous for all $\overline{a} \in \mathbb{R}_+$. We prove Result E5 in several steps.

Proof that $\overline{a}^{**}_{ll} \leq a_\pi$ *for all* $\gamma \in (0, 1)$. Same as in proof of Lemma 4 and omitted here.

Let $\gamma \in (0, \gamma_{sr})$. The proof that $\overline{a}^{**}_{ll} = \overline{a}^{**}_{ch} < a^u_{sr}$ in this case is the same as in proof of Lemma 4 and omitted here.

Let $\gamma = \gamma_{sr}$. The proof that $\overline{a}^{**}_{ll} = a^u_{sr}$ in that case is very similar to the proof of Lemma 4 and omitted here.

Let $\gamma \in (\gamma_{sr}, \gamma_{ll}]$. Consider the region where $\overline{a} \in (a^u_{sr}, \overline{a}_1]$. In this region, $\frac{dU_{ll}}{d\overline{a}} = -\left[\rho - \frac{1-\gamma}{\gamma}\right] S'(\overline{a})$. Since $\gamma > \gamma_{sr}$ if and only if $\rho > \frac{1-\gamma}{\gamma}$, we must have $\frac{dU_{ll}}{d\overline{a}} > 0$ for all $\overline{a} \in (a^u_{sr}, \overline{a}_1]$. Hence the value of $\overline{a} \in (a^u_{sr}, \overline{a}_1]$ that maximizes U_{ll} over that region is $\overline{a}_1$.

Now consider the region where $\overline{a} \in (\overline{a}_1, a_\pi]$. In this region, $\frac{dU_{ll}}{d\overline{a}} = \frac{dV}{d\overline{a}}$. By definition, $\overline{a}_2(\gamma_{ll}) = \overline{a}_1$, and Result E3 implies $\overline{a}_2(\gamma) \leq \overline{a}_1$ for all $\gamma \leq \gamma_{ll}$. By the strict concavity of $V(.)$, it then follows that $\frac{dU_{ll}}{d\overline{a}} = \frac{dV}{d\overline{a}} < 0$ for all $\overline{a} \in (\overline{a}_1, a_\pi]$.

Finally, consider the region where $\overline{a} \in [0, a^u_{sr}]$. Since as discussed above $\pi'(a^u_{sr}) + \rho S'(a^u_{sr}) = 0$, and since $\rho > \frac{1-\gamma}{\gamma}$, it must be that $\frac{dU_{ll}}{d\overline{a}} = \pi'(a^u_{sr}) + \frac{1-\gamma}{\gamma} S'(a^u_{sr}) > 0$. The strict concavity of U_{ll} over $[0, a^u_{sr}]$ then implies $\frac{dU_{ll}}{d\overline{a}} > 0$ for all $\overline{a} \in [0, a^u_{sr}]$. Hence the value of $\overline{a} \in [0, a^u_{sr}]$ that maximizes U_{ll} over that region is a^u_{sr}.

Since U_{ll} is continuous for all $\overline{a} \in \mathbb{R}_+$, the preceding results imply directly that for $\gamma \in (\gamma_{sr}, \gamma_{ll}]$, the value of $\overline{a}$ that maximizes U_{ll} is $\overline{a}_1$.

Let $\gamma \in (\gamma_{ll}, \gamma_\pi]$. Consider the region where $\overline{a} \in (a^u_{sr}, \overline{a}_1]$. As in the previous case, and for the same reasons, the value of $\overline{a} \in (a^u_{sr}, \overline{a}_1]$ that maximizes U_{ll} over that region is $\overline{a}_1$.

Next consider the region where $\overline{a} \in (\overline{a}_1, a_\pi]$. In this region, $\frac{dU_{ll}}{d\overline{a}} = \frac{dV}{d\overline{a}}$. By definition, $\overline{a}_2(\gamma_{ll}) = \overline{a}_1$, and Result E3 implies $\overline{a}_2(\gamma) > \overline{a}_1$ for all $\gamma > \gamma_{ll}$. Hence the value of $\overline{a} \in (\overline{a}_1, a_\pi]$ that maximizes U_{ll} over that region is $\overline{a}_2(\gamma)$. The strict concavity of $V(.)$ and the continuity of U_{ll} over $\mathbb{R}^+$ immediately implies $U_{ll}(\overline{a}_2(\gamma)) > U_{ll}(\overline{a}_1)$.

Finally, consider the region where $\overline{a} \in [0, a^u_{sr}]$. As in the previous case, and for the same reasons, the value of $\overline{a} \in [0, a^u_{sr}]$ that maximizes U_{ll} over that region is a^u_{sr}. The continuity of U_{ll} and the fact that $\frac{dU_{ll}}{d\overline{a}} > 0$ for all $\overline{a} \in (a^u_{sr}, \overline{a}_1]$ imply $U_{ll}(a^u_{sr}) < U_{ll}(\overline{a}_1)$. By transitivity we also have $U_{ll}(a^u_{sr}) < U_{ll}(\overline{a}_2(\gamma))$. Thus, overall, for $\gamma \in (\gamma_{ll}, \gamma_\pi]$, the value of $\overline{a}$ that maximizes U_{ll} is $\overline{a}_2(\gamma)$.

Let $\gamma \in (\gamma_\pi, 1)$. Consider the region where $\overline{a} \in (a^u_{sr}, \overline{a}_1]$. As in the previous case, and for the same reasons, the value of $\overline{a} \in (a^u_{sr}, \overline{a}_1]$ that maximizes U_{ll} over that region is $\overline{a}_1$.

Next consider the region where $\overline{a} \in (\overline{a}_1, a_\pi]$. In this region, $\frac{dU_{ll}}{d\overline{a}} = \frac{dV}{d\overline{a}}$. By definition, $\overline{a}_2(\gamma_\pi) = a_\pi$, and Result E3 implies $dV(\overline{a})/d\overline{a} > 0$ for all $\overline{a} \in (\overline{a}_1, a_\pi]$. Hence the value of $\overline{a} \in (\overline{a}_1, a_\pi]$ that maximizes U_{ll} over that region is a_π. The strict concavity of $V(.)$ and the continuity of U_{ll} over $\mathbb{R}^+$ immediately implies $U_{ll}(a_\pi) > U_{ll}(\overline{a}_1)$.

Finally, consider the region where $\overline{a} \in [0, a^u_{sr}]$. As in the previous case, and for the same reasons, the value of $\overline{a} \in [0, a^u_{sr}]$ that maximizes U_{ll} over that region is a^u_{sr}, with $U_{ll}(a^u_{sr}) < U_{ll}(\overline{a}_1)$. By transitivity we also have $U_{ll}(a^u_{sr}) < U_{ll}(a_\pi)$. Thus, overall, for $\gamma \in (\gamma_\pi, 1)$, the value of $\overline{a}$ that maximizes U_{ll} is a_π. $\square$

We depict the equilibrium regulatory ceiling $\overline{a}^{**}_{ll}(\gamma)$ in the case where the firm has a choice between the two types of wealth-constrained managers, together with the equilibrium regulatory ceilings derived in the main model, in Figure 7.

[INSERT FIGURE 7 ABOUT HERE]

Note that when government inefficiency $\gamma > \gamma_{sr}$, we have $\overline{a}^{**}_{ll}(\gamma) \leq \overline{a}^{**}_{sr}(\gamma)$. This comes from the fact that the firm, anticipating that the worker's wealth constraint will reduces the rents it can extract from the worker ex post, has less incentives to lobby to raise the regulatory ceiling ex ante.

We state the equilibrium in the following lemma:

Lemma 5 *As long as $\gamma > 0$, when the firm can choose between a self-interested worker and a socially responsible worker, and managers are wealth-constrained with wealth w_0, the following cases arise:*

- *If $\gamma \in (0, \gamma_{sr}]$. At date 0 the firm makes political contribution $C^{**}_{ll}(\gamma) > 0$ to the government, in exchange for setting regulatory ceiling $\overline{a}^{**}_{ll}(\gamma) = \overline{a}^{**}_{ch}(\gamma)$, with $\overline{a}^{**}_{ch}(\gamma) \in (a^*, a^u_{sr}]$ and $d\overline{a}^{**}_{ch}/d\gamma > 0$. At date 1, the firm hires either worker and requests action $a_{ll} = \overline{a}^{**}_{ch}(\gamma)$. At date 2, the hired worker takes action $\overline{a}^{**}_{ch}(\gamma)$ and receives compensation $W_{ll}(\overline{a}^{**}_{ch}(\gamma)) = W_{sr}(\overline{a}^{**}_{ch}(\gamma)) = W_{si}(\overline{a}^{**}_{ch}(\gamma))$; and the firm obtains payoff $\pi(\overline{a}^{**}_{ch}(\gamma))$.*

- *If $\gamma \in (\gamma_{sr}, \gamma_{ll}]$. At date 0 the firm makes political contribution $C^{**}_{ll}(\gamma) > 0$ to the government, in exchange for setting regulatory ceiling $\overline{a}^{**}_{ll}(\gamma) = \overline{a}_1$. At date 1, the firm hires the* *sr worker and requests action* $a_{ll} = a^u_{sr}$*. At date 2, the hired sr worker takes action* a^u_{sr} *and receives compensation* $W_{sr}(a^u_{sr})$*; and the firm obtains payoff* $\pi(a^u_{sr}) + \rho[S(a^u_{sr}) - S(\overline{a}_1)]$.

- *If* $\gamma \in (\gamma_{ll}, \gamma_\pi]$*. At date 0 the firm makes political contribution* $C^{**}_{ll}(\gamma) > 0$ *to the government, in exchange for setting regulatory ceiling* $\overline{a}^{**}_{ll}(\gamma) = \overline{a}_2(\gamma)$*. At date 1, the firm hires the sr worker and requests action* $a_{ll} = \widehat{a}_{ll}(\overline{a}_2(\gamma))$*. At date 2, the hired sr worker takes action* $\widehat{a}_{ll}(\overline{a}_2(\gamma))$ *and receives compensation* $W_{ll}(\widehat{a}_{ll}(\overline{a}_2(\gamma))) = -w_0$*; and the firm obtains payoff* $\pi(\widehat{a}_{ll}(\overline{a}_2(\gamma))) + w_0$.

- *If* $\gamma \in (\gamma_\pi, 1)$*. At date 0 the firm makes political contribution* $C^{**}_{ll}(\gamma) > 0$ *to the government, in exchange for setting regulatory ceiling* $\overline{a}^{**}_{ll}(\gamma) = a_\pi$*. At date 1, the firm hires the sr worker and requests action* $a_{ll} = \widehat{a}_{ll}(a_\pi)$*. At date 2, the hired sr worker takes action* $\widehat{a}_{ll}(a_\pi)$ *and receives compensation* $W_{ll}(\widehat{a}_{ll}(a_\pi)) = -w_0$*; and the firm obtains payoff* $\pi(\widehat{a}_{ll}(a_\pi)) + w_0$.

Proof of Lemma 5. Follows directly from Results E1-E5. □

The intuition behind Lemma 5 can be illustrated with Figure 7. When $\gamma \in (0, \gamma_{sr}]$, the situation is the same as in the main model: the government is efficient and lobbying is costly. The equilibrium ceiling $\overline{a}^{**}_{ll}(\gamma)$ is below a^u_{sr}, and the firm is indifferent between the two types of entrepreneurs.

For all $\gamma > \gamma_{sr}$, the firm anticipates it will hire the *sr* worker. When $\gamma \in (\gamma_{sr}, \gamma_{ll}]$, the firm sets the ceiling at $\overline{a}_1$ such that, by requesting action a^u_{sr} from the worker, it can extract rents from him equal to his entire wealth $w_0 = \rho[S(a^u_{sr}) - S(\overline{a}_1)]$. When $\gamma \in (\gamma_{ll}, \gamma_\pi]$, government inefficiency increases further and lobbying becomes "cheaper." It then becomes optimal for the firm to raise the ceiling to $\overline{a}_2(\gamma) > \overline{a}_1$, and to raise the requested managerial action $\widehat{a}_{ll}(\overline{a}_2(\gamma))$ in order to generate and extract a social responsibility wedge exactly equal to the worker's wealth. Finally, when $\gamma \in (\gamma_\pi, 1)$, lobbying is so cheap that the highest ceiling a_π becomes optimal, with equilibrium action $\widehat{a}_{ll}(a_\pi)$ still chosen so as to make the social responsibility wedge exactly equal to w_0. In other words, for all $\gamma > \gamma_{sr}$, the firm extract all of the *sr* worker's wealth through the social responsibility wedge, with the regulatory ceiling weakly increasing with government inefficiency.

Importantly, the key results from the main model continue to hold overall when we assume wealth-constrained managers. Proposition 5, for example, continues to hold (the proof follows directly from the above analysis and is illustrated in Figure 6). Moreover, similar to Proposition 6, we can show that:

Proposition 7 *When the sr worker is wealth constrained, there exist non-empty sets of values of* γ, $\Theta_1 \subset (\gamma_{sr}, 1)$ *and* $\Theta_2 \subset (\gamma_{sr}, 1)$ *such that for all* $\gamma \in \Theta_1$ *social responsibility has a negative impact on social welfare, and for all* $\gamma \in \Theta_2$ *social responsibility has a positive impact on social welfare.*

Proof of Proposition 7. In the case of a wealth-constrained *sr* worker, the welfare impact of social responsibility can be expressed as:

$$\Delta TS_{2ll}(\gamma) = (1+\rho)\left[S(a_{ll}) - S\left(\overline{a}_{si}^{**}(\gamma)\right)\right] - \frac{1-\gamma}{\gamma}\left[S\left(\overline{a}_{si}^{**}(\gamma)\right) - S\left(\overline{a}_{ll}^{**}(\gamma)\right)\right]. \tag{43}$$

It is easy to verify from the above analysis and from Figure 7 that:

$$\begin{array}{l} \lim\limits_{\gamma\to\gamma_{sr}^{+}} \overline{a}_{si}^{**}(\gamma) = a_{sr}^{u} = \lim\limits_{\gamma\to\gamma_{sr}^{+}} a_{ll}, \text{ and } \lim\limits_{\gamma\to\gamma_{sr}^{+}} \overline{a}_{ll}^{**}(\gamma) = \overline{a}_1 > a_{sr}^{u} \\ \text{hence} \\ \lim\limits_{\gamma\to\gamma_{sr}^{+}} \Delta TS_{2ll}(\gamma) = -\frac{1-\gamma}{\gamma}\left[S\left(a_{sr}^{u}\right) - S\left(\overline{a}_1\right)\right] < 0. \end{array} \tag{44}$$

Similarly, one can verify that:

$$\begin{array}{l} \lim\limits_{\gamma\to1} \overline{a}_{si}^{**}(\gamma) = a_{\pi} = \lim\limits_{\gamma\to1} \overline{a}_{si}^{**}(\gamma), \text{ and } \lim\limits_{\gamma\to1} a_{ll} = \widehat{a}_{ll}(a_{\pi}) < a_{\pi} \\ \text{hence} \\ \lim\limits_{\gamma\to\gamma_{sr}^{+}} \Delta TS_{2ll}(\gamma) = (1+\rho)\left[S\left(\widehat{a}_{ll}(a_{\pi})\right) - S(a_{\pi})\right] > 0. \end{array} \tag{45}$$

It then follows directly that there must exist non-empty sets of values of γ, $\Theta_1 \subset (\gamma_{sr}, 1)$ and $\Theta_2 \subset (\gamma_{sr}, 1)$ such that for all $\gamma \in \Theta_1$ social responsibility has a negative impact on social welfare, and for all $\gamma \in \Theta_2$ social responsibility has a positive impact on social welfare. □

B.2 Non-Contractibility of Actions

Recall that in the main model we assumed for simplicity that the worker's action a was contractible and that accordingly the firm offered an action-contingent contract $W(a)$ to the worker it wishes to hire. Suppose instead that managerial action a were not verifiable and hence could not be contracted upon. Clearly, in the case of the *si* worker, nothing changes: since the action is costless, he selects the firm's preferred action as in the main model.

In the case of the *sr* worker, the only difference is that - when unconstrained by regulatory ceiling $\overline{a}$ - the worker chooses his preferred action, first-best action a^*, instead of the firm's preferred action a^u_{sr}. Indeed, one can easily verify that all of the results of the model continue to hold, simply replacing a^u_{sr} by a^*.

B.3 Asymmetric Information in Agent Type

Another implicit assumption in the main model is that the firm can identify whether the worker is self-interested or socially responsible. But as argued by Carlin and Gervais (2009), in practice it may be difficult for the firm to identify managerial types. Thus an natural extension to our model would be to examine the asymmetric information scenario in which the worker's type is unknown to the firm. While such an extension is beyond the scope of this paper, we conjecture that the results of our model would remain qualitatively the same.

Intuitively, the *si* would have no incentive to masquerade as a *sr* worker, since that would lead to a lower wage, without any benefit: the *si* worker does not value the lower action a_{sr} that would be associated with this reduced compensation. On the other hand, in some circumstances the *sr* worker may want to masquerade as a *si* worker, if the increase in wage associated with doing more than offsets the decrease in utility associated with a greater action a_{si}. In equilibrium, the firm would offer a menu of contracts to screen between managers. We anticipate that while the *si* worker's chosen contract would likely remain similar to his full-information contract, the *sr* worker's chosen contract would include a greater action and/or a greater wage than in the full-information case. This would ensure incentive compatibility - i.e. it would eliminate the *sr* worker incentive to mimick the *si* worker - but would force the firm to leave a so-called information rent to the *sr* worker. This loss of expected rent extraction for the firm would likely reduce its incentive to lobby the government in the first place, much as in the limited liability extension discussed above. Nevertheless, despite these minor differences, we believe that the main insights of the paper - that access to responsible managers would lead to socially superior actions but to more wasteful lobbying - would continue to hold.

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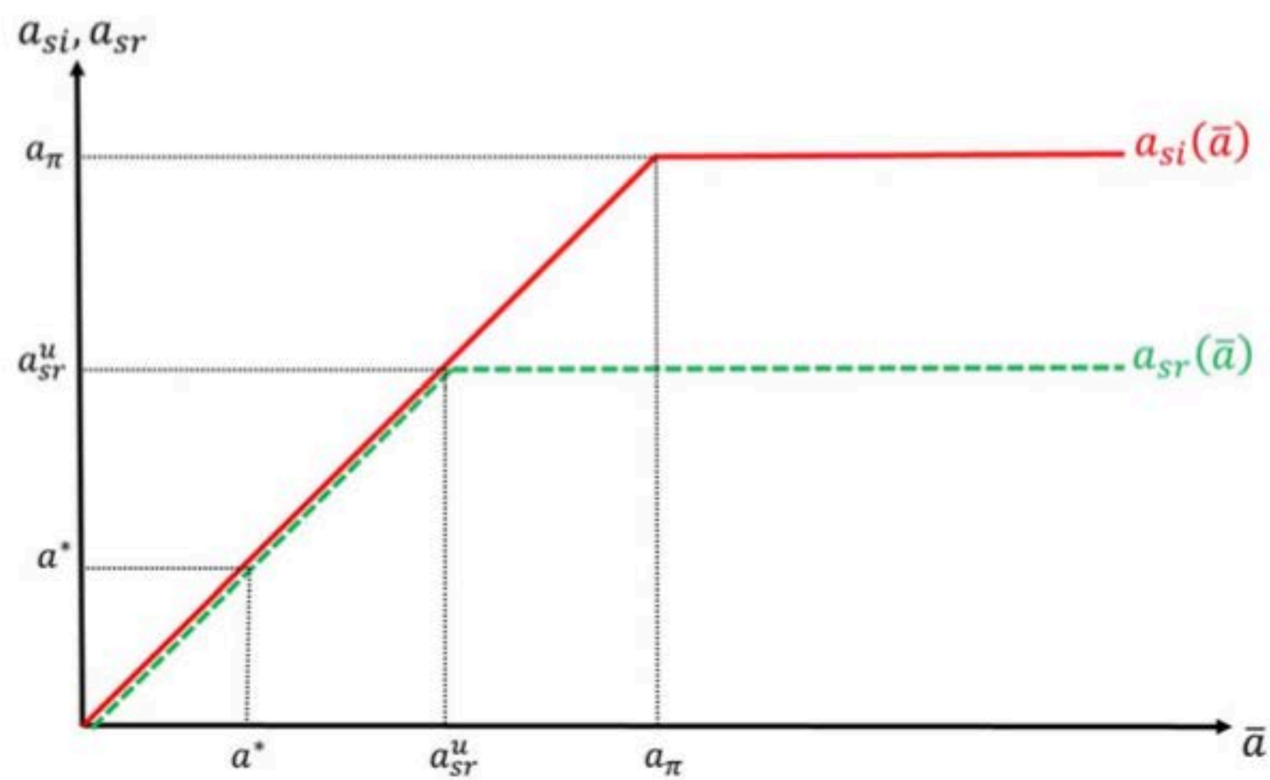


<u>Figure 1:</u> Equilibrium actions for *si* and *sr* managers, as functions of regulatory ceiling $\bar{a}$.

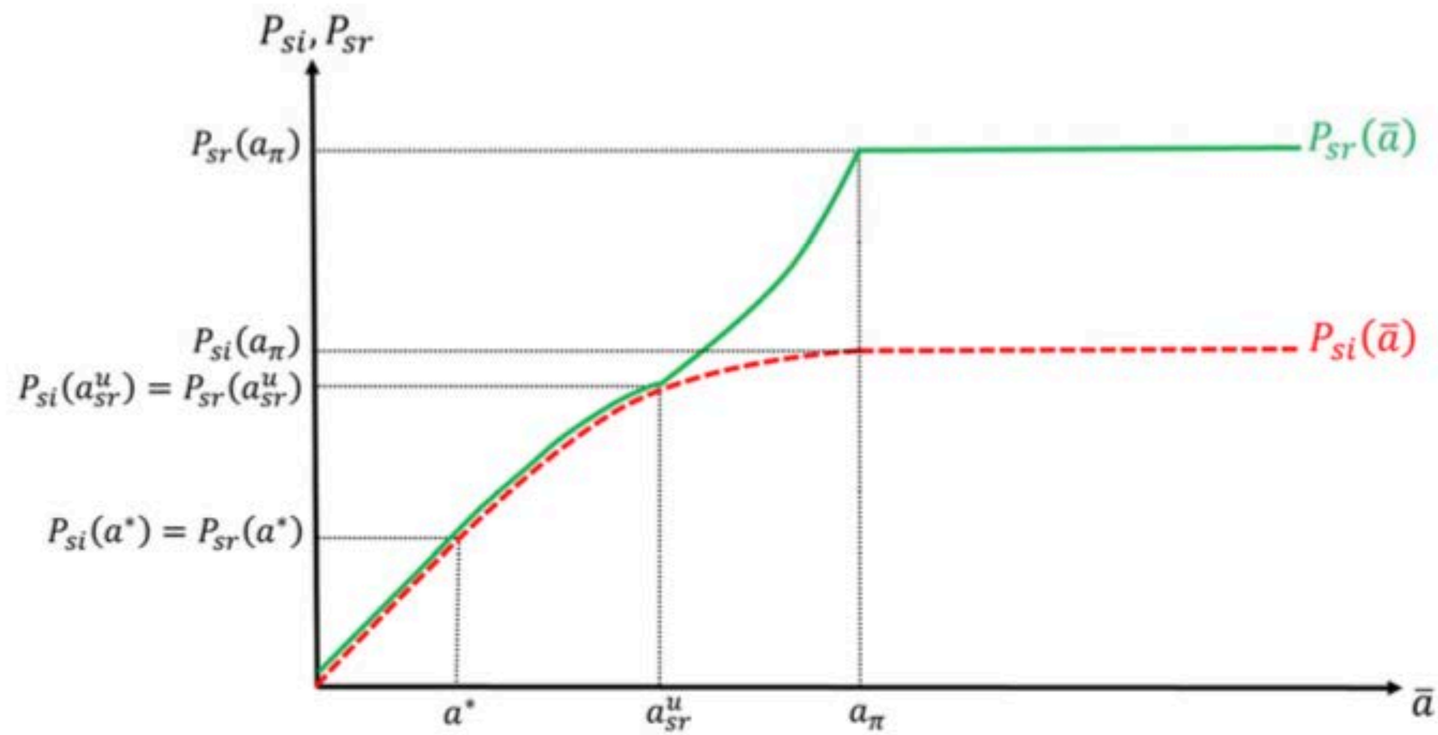


Figure 2: Firms' payoffs (gross of possible political contributions) as functions of regulatory ceiling $\bar{a}$, depending on the type of manager (*si* or *sr*) hired by the firm.

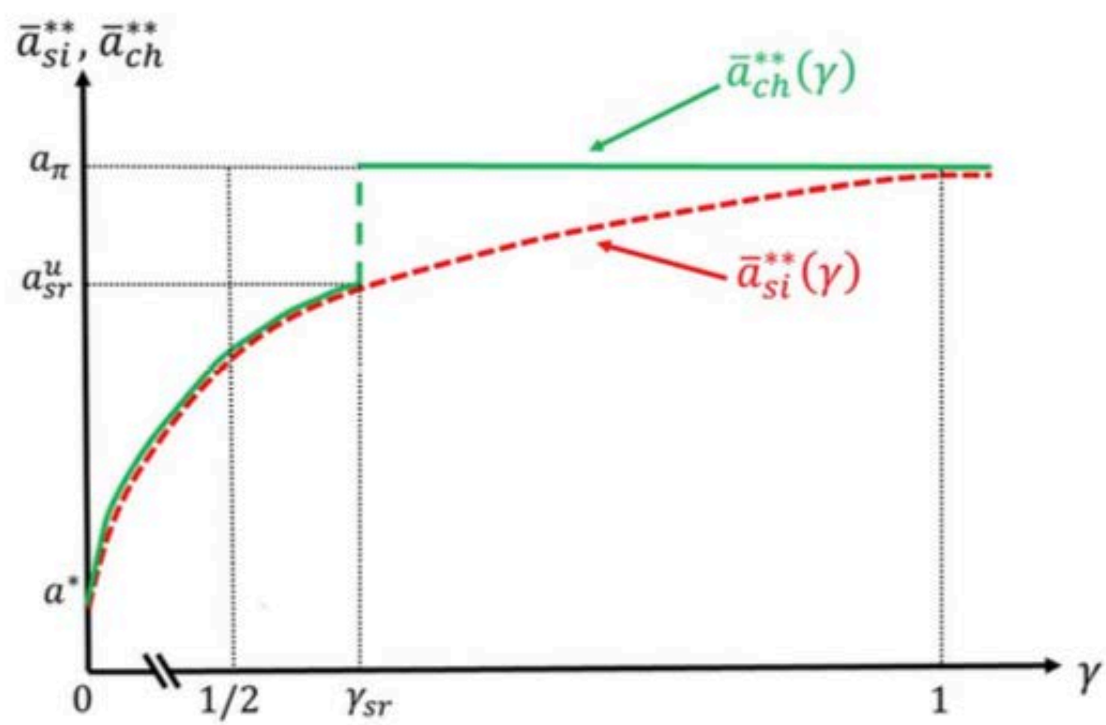


Figure 3: Equilibrium regulatory ceilings lobbied by the firm at date 0 as function of government inefficiency γ, in the case where only the *si* manager is available (*si* subscript), and in the case where the firm has a choice (*ch* subscript) between hiring either type of manager (*si* or *sr*).

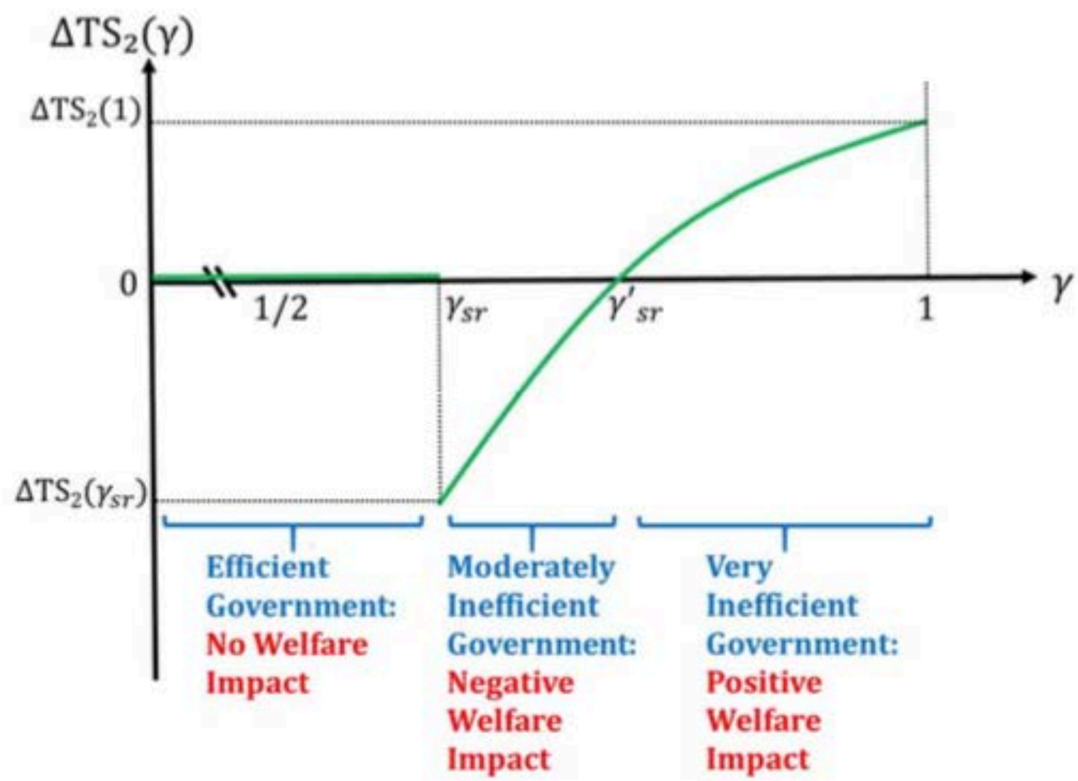
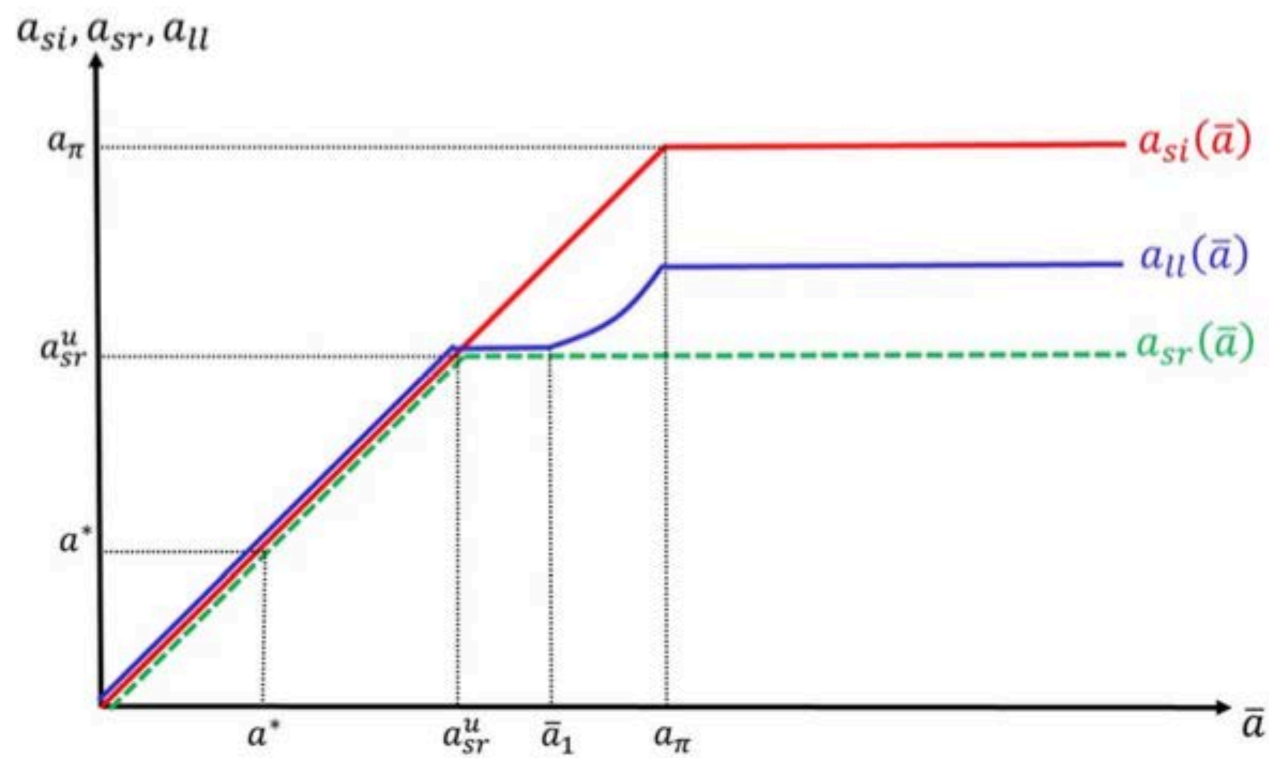
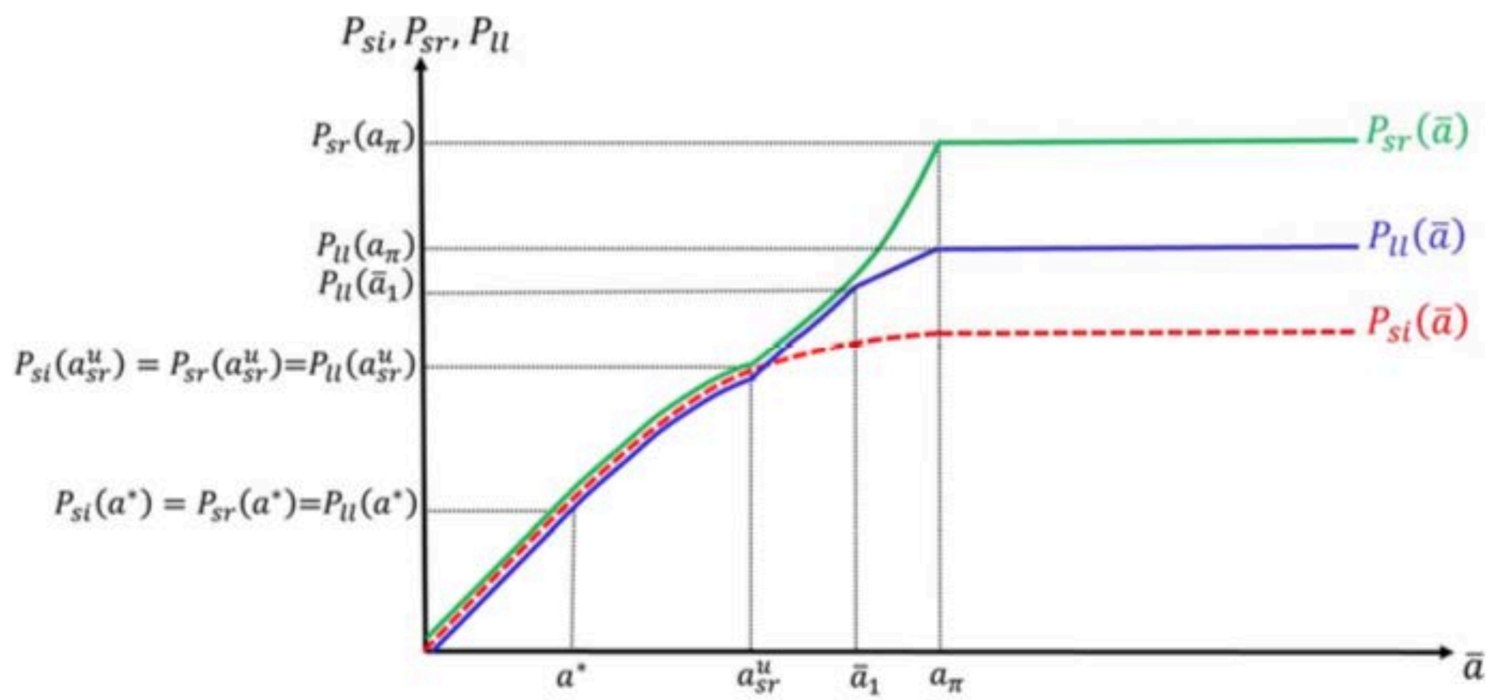


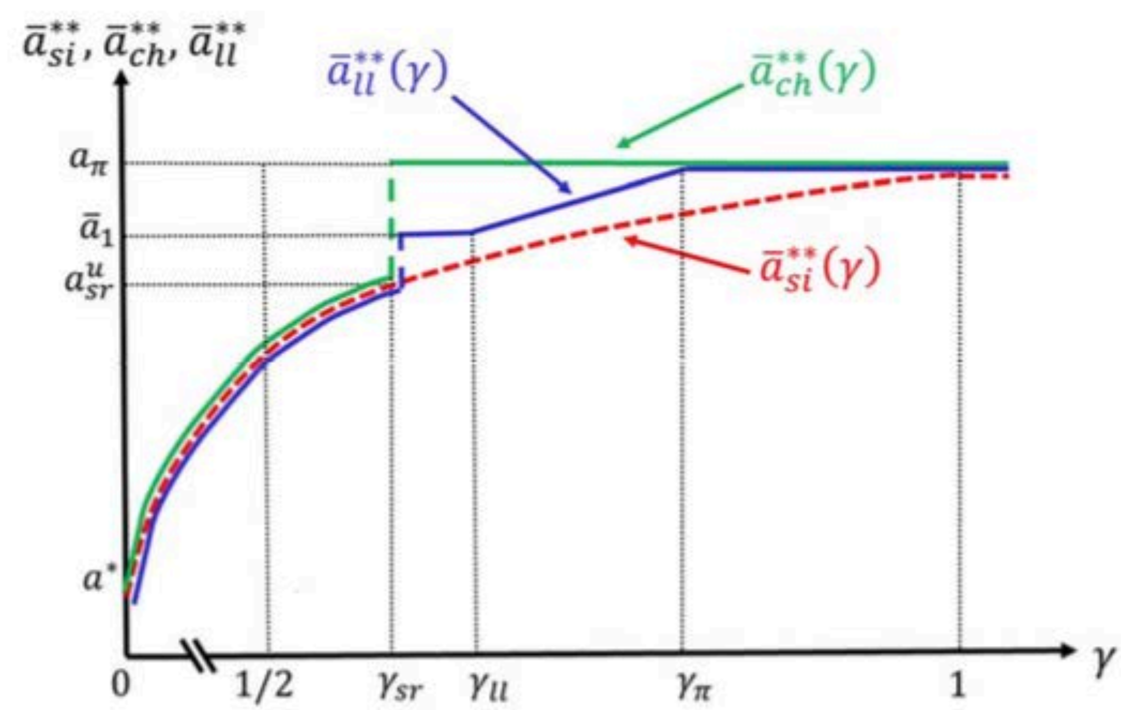
Figure 4: Welfare impact of having access to a *sr* manager in the labor market, as function of government inefficiency γ.



<u>Figure 5:</u> Equilibrium managerial actions. Subscript *si* refers to the *si* manager (whether or not he is wealth-constrained). Subscript *sr* refers to the *sr* manager in the standard case, while subscript *ll* refers to the *sr* manager in the wealth-constrained case.



<u>Figure 6:</u> Firms' payoffs from hiring either type of manager, as functions of regulatory ceiling $\bar{a}$. Subscript *si* refers to the *si* manager (wealth-constrained or not). Subscript *sr* refers to the *sr* manager in the standard case, and subscript *ll* refers to the *sr* manager in the wealth-constrained case.



<u>Figure 7:</u> Equilibrium regulatory ceilings lobbied by the firm at date 0 as function of government inefficiency γ. Subscript *si* refers to the case where only the *si* manager is available (wealth-constrained or not); subscript *ch* refers to the standard case where both managers are available in the labor market and neither is wealth-constrained; subscript *ll* refers to the case where both managers are available in the labor market and both are wealth-constrained.