Damages for Breach of Contract: Should the Government Get Special Treatment?

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Contracts that involve the government differ from contracts between two private parties in that the identity of one of the parties, the government, is subject to change. Given that the incumbent government knows that it might not be in power when the contract is completed, it may have an incentive to structure the contract to make it more difficult for a new government to renegotiate it. I show that traditional damage measures used in contracts between two private parties exacerbate this problem. The reliance damage measure induces the incumbent government to enlarge projects beyond the socially optimal level when it fears that a new government will want to cut it back. Expectation damages suffer from the same defect, though to a lesser extent.

1. Introduction

Damages for breach of contract by private parties are designed to prevent holdup and provide incentives for efficient performance and breach. If the buyer of a good could renege on the purchase price after the seller made it, then the renegotiation price might not be sufficient to compensate the seller for its costs. Requiring the buyer to pay the seller damages when she breaches the contract, however, will prevent this holdup problem, though not necessarily perfectly (Shavell, 1980). Breach can occur, however, for reasons other than holdup. Circumstances may change so that the value of the good to the buyer is such that she no longer wishes to purchase it. The buyer should consider this possibility, with a view to her later utility, when she agrees to the contract. When the buyer is the government, however, there is one change of circumstance that the government will not consider when attempting to maximize its utility: the possibility that an election will change the identity of the government/buyer. If the incumbent party loses an election between the writing of the contract and its performance, then the value of...
performance to the buyer will certainly change. In this situation, one group of people can sign a contract that later binds another group with a different set of preferences.

Consider a left-wing government that’s embarking on a public works project. It knows that if it loses the next election a right-wing government will not want nearly as large a project. It will have no incentive to consider the preferences of the opposing party when it contracts with construction companies to build the project.\footnote{A recent example of the situation I model occurred in the redevelopment of Pearson airport in Toronto, though the political leanings of the parties were reversed in that case. The Conservative-run federal government contracted with a private consortium to redevelop part of the airport. The redevelopment was subject to intense public scrutiny during the 1993 election campaign. The Liberals canceled the project when they took office. The damages the Canadian government must pay are still under dispute. See Daniels and Trebilcock (1996) for a more complete discussion of this case.} In fact, it might prefer to make it hard for the right-wing party to reduce the size of the project. The firm building the project will also not have any incentive to consider the preferences of a potentially new government. In this way, the existence of long-term government contracts can work to undercut the ability of popular elections to change the course of government policy. Because of this problem, courts should treat government breach of a contract entered into by the prior government differently from a breach of contract between two private parties whose identities have not changed.\footnote{This situation could arise with contracts between two private parties. For example, if one party is facing the possibility of a hostile takeover, then the current managers may engage in contracts that may bind their successors. The analysis of this article may apply to that case, though the preferences that managers would have over projects when they are not in power might be quite different from the assumptions made about the preferences of a deposed political party.}

Most of the results in the first part of the article stem from the Lemma 1. There I show that an incumbent government can influence the policies of a potential successor through its long-term contracts. The larger the project that the current government starts, the larger the project the successor government will agree to when it renegotiates the contract with the firm. Once the initial contract is signed, the firm starts to build the project to meet the specifications of that contract. When a new government is elected, the firm has already incurred much of the costs of building a large-scale project. Thus the more the project must be cut back, the less effective additional cuts will be at saving costs. Larger initial project scale thus reduces the marginal cost for the second government of choosing a larger final project size.\footnote{I do not mean to say that holdup will never be a concern in this situation. When it is, courts will have to balance the use of damages to prevent holdup with the use of damages to prevent this strategic political opportunism.}

Since the current government prefers a larger project than does its opposition, it has an incentive to increase the size of the project to tie the...
hands of its potential successor. The first proposition explains that while this effect may lead the current government to choose a project size that is larger than is socially optimal, there is another effect that pushes in the opposite direction. The second effect stems from the fact that the first government views spending made by its successor as less costly than spending it makes itself. The contract that the government signs with the firm will influence the bargaining power of the firm in its renegotiation with any future government. The firm’s bargaining power is based on its outside option. In this case, the outside option comes about when the new government chooses to breach the original contract (thus canceling the project entirely) rather than renegotiate it or honor it as written. The larger the initial project, the less money the firm can save (on the margin) by not completing the project if the new government chooses to breach. Ignoring, for the moment, damages for breach, the firm’s outside option is worse the larger is the initial project. This reduces the price the firm receives from the new government when renegotiating. This hurts the initial government, since it will have to pay the firm more to meet its participation constraint. This effect will tend to induce the first government to reduce the initial project size. (The reverse case, where the opposition party will want to increase the scale of the project will cause analogous problems. I do not analyze that case because the preferred outside option of the new government will be to accept the original contract, since breach will result in a project of size zero, farther away from the new government’s ideal. When the second government’s outside option is to accept the contract, damage rules will not affect the behavior of the original government.)

When one uses damage measures designed to reduce holdup problems (e.g., reliance or expectation damages), however, the second effect disappears. Reliance damages compensate the firm for the costs it incurred in building the project. Expectation damages compensate the firm for the profits it loses as a result of the breach. With either of these damage measures, a larger initial project will not weaken the outside option of the firm. Hence use of traditional damage measures guarantee that the current government will choose an initial project scale that is larger than socially optimal. This is similar to the results of Shavell (1980) and Rogerson (1984), who demonstrate that damage measures can induce excessive reliance. In my model, however, the excessive scale is in the initial contract, not a noncontractible reliance investment. This is true for reliance damages. The other most commonly used damage measure, expectation damages, suffers from the same defect, though not as severely.

Most government procurement contracts are not governed by expectation or reliance damages, but by a “termination for convenience” provision (Fischel and Sykes, 1999). Under this provision, however, the damages the contractor is entitled to receive closely mirror reliance damages (with a small expectation component). As a result, this provision represents no improvement over traditional damage measures. In fact, one reason why termination for convenience is so prevalent in government contracts may be
because it enhances a government’s ability to protect its pet projects should it lose power. Even a party that almost universally prefers smaller government projects will not have much incentive to change this rule. The rival party, when it takes power, would only put the termination for convenience provision back in place. Thus temporarily changing the rule will only limit the small government party’s ability to protect those few projects that it does prefer more than its rival.5

Because the second government is not involved in the contract negotiations, a particular contractually specified damage rule would likely be no better. The first government would want to specify very large damages. This will strengthen the bargaining position of the firm should the contract be renegotiated by a later government. In fact, it will want to make damages large enough that its successor will prefer to abide by the initial contract rather than to breach. This gives the first government a greater incentive (relative to even reliance damages) to increase the size of the initial contract, so as to shift more of the costs of meeting the firm’s participation constraint onto the second government.

The alternative that this article considers is damages that are independent of initial project size (I will refer to these as constant damages). In practice, this might mean that courts have tables of damages for different types of contracts. For example, there might be a predetermined level of damages for the breach of a contract to build tanks (or a certain type of tank). This amount would be constant regardless of how many tanks the contract specified the firm actually build. Of course, such a damage measure would not be ideal for breach motivated by holdup or other considerations. In this article I am assuming there is only one motive for breach. In reality, courts will have to balance competing considerations. This may warrant using some weighted average of constant damages and expectation damages. Even if constant damages are not always feasible, their theoretical superiority for the breach motivation considered here indicates that courts sometimes will want to dampen the relationship between damages and initial project size.

The article is organized as follows. Section 2 reviews the related literature. Section 3 describes the model. Section 4 presents the results on the effects of traditional damage measures. Section 5 concludes. Most of the proofs are in the appendix.

2. Related Literature

There is substantial literature describing why governments do not adopt socially optimal policies in dynamic settings. The literature on the ratchet

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5. I am grateful to an anonymous referee for pointing this out. This referee also made the point that a more effective method for accomplishing this objective would be for a government breaching a contract to withdraw jurisdiction from the courts to hear the case. One reason we don’t observe this happening may be because the political fallout from doing this would be too great.
effect, for example, describes how a government regulator will act opportunistically, if not bound by a long-term contract, when a firm has demonstrated it can produce at a low cost. This can reduce the incentive of the regulated firm to exert effort to produce at a low cost in the first period (Freixas, Guesnerie, and Tirole, 1985; Laffont and Tirole, 1993:chap. 9 among many others). Dixit (1996:63–67) discusses several other examples of how the inability of a government to commit to a long-term policy can force it to adopt less efficient, second-best solutions.

In many of these cases, giving the government the power to commit to long-term policies will eliminate much, if not all, of the inefficiency. One reason that governments may lack the ability to commit to long-term policies is that democratic elections may change which party is in power. Government turnover, however, has also been analyzed as an independent source of inefficient policy making. Besley and Coate (1998) have demonstrated how the possibility of political turnover in a representative democracy can cause a government not to adopt Pareto-improving policies. Glazer (1989) shows how the inability to bind future voters can cause a voter to support a durable public project when she otherwise would not. Moe (1995) has argued that the danger of losing power greatly influences how politicians implement policies. They may often be more concerned with inhibiting the ability of a future government to overturn their policies than with implementing them in the most efficient fashion. A current government, for example, may increase the level of public debt to reduce the level of public consumption chosen by a later government (Persson and Svensson, 1989; Alesina and Tabellini, 1990).6

Like all those articles, this one deals with democratic political turnover and efficient policy making. In those articles, however, political turnover is the source of problem. This article, on the other hand, explicitly models how social welfare is related to the outcome of elections and examines how an incumbent government can use contracts to inhibit the effectiveness of elections in aligning policies with social welfare. In this sense, the spirit of the article is similar to Laffont and Tirole (1993:chap. 16) and Tirole (1994). They show that preventing intertemporal government commitment can sometimes be optimal, even in the presence of a ratchet effect, because it allows a government to reverse the inefficient policies of its predecessor. All these articles, however, assume that commitment either exists or does not exist. My focus is on describing how effective contracts are in giving a government commitment power. The most important contribution of this article is to show how different damage rules for breach of contract affect

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6. There is also some connection with the corporate finance literature on managerial entrenchment. In these models a manager invests the firm’s resources to enhance the marginal value of that manager’s human capital vis-à-vis a potential replacement in order to entrench his position (Shleifer and Vishny, 1989). Managers could use long-term contracts to entrench their positions and changing damage measures for breach might limit the effectiveness of this strategy.
a government’s ability to use contracts to reduce its successor’s freedom to change policies.

While not directly related, this article also draws motivation from the literature on individual decision making with dynamically inconsistent preferences. This literature models dynamic decisions as an intrapersonal game among different temporal selves (Laibson, 1997b), just as my model is a game between two different incarnations of a government (a single contracting entity). Though for different reasons (inability to commit rather than excessive commitment), this literature also shows that suboptimal outcomes result from the time-varying preferences of the decision maker (Strotz, 1956; Phelps and Pollak, 1968; Laibson, 1997a).

In the legal literature, opinion is divided as to whether the law should treat government like a private party, making it pay expectation damages for breach of contract (Epstein, 1984; Worthington, 1996), or be able to void contracts without paying damages (Gerstein, 1988). In United States v. Winstar Corp, 116 S. Ct. 2432 (1996), the Supreme Court held that when the United States government passed legislation that reneged on earlier promises it is liable for damages, even if this restricts its lawmaking authority. On the other hand, some courts allow local governments to void contracts that run beyond the term in which the contract was signed. [The remaining jurisdictions treat such contracts identical to contracts between private parties (Gerstein, 1988).]

In the law and economics literature there is some argument for treating the government like a private party when it abrogates its contractual commitments, making it liable for expectation damages. The main justification for this is to prevent holdup when parties have made relationship-specific investments (Daniels and Trebilcock, 1996). They do not consider the problem that one government can use long-term contracts to limit the ability of its successor government to change policy. Hadfield (1998) and Fischel and Sykes (1999) do consider this problem, though neither explicitly models the government’s decision-making problem. Hadfield argues in favor of reliance damages. She claims that expectation damages may raise the cost to a subsequent government of breaching a long-term contract and thereby impair the ability of the democratic process to effect policy change (Hadfield, 1997). My model yields different results from hers, because in my model the costs of breaching the contract are greater under reliance damages since the firm loses money under the initial contract.

Fischel and Sykes focus on the greater agency and rent-seeking problems inherent in governmental organizations relative to private firms to argue that the standard economic theory of contract damages does not apply well to government. When they do briefly mention the ability of a political party to use

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7. This holding is in some tension with some (though not all) prior Supreme Court rulings where the Court has held that the government cannot use a long-term contract with an individual to restrain the power of a subsequent government to legislate to promote public welfare. These prior cases, as well as the Winstar case are discussed in more detail in Fischel and Sykes (1999).
contracts to maintain its policies after an electoral defeat, they argue that the “termination for convenience” clause will likely mitigate this problem. The statutorily allowed damages following “termination for convenience,” however, are closer to reliance damages than expectation damages, and are not even close to constant damages. Thus, in fact, termination for convenience only magnifies the ability of the current government to lock in its policies after an electoral defeat. (Fischel and Sykes do point out, however, that the reliance damages nature of termination for convenience may be inefficient for other reasons.)

3. The Model

There are two political parties that can run the government. While median voter theory suggests that two competing political parties should have very similar policy preferences, many empirical studies have shown that the median voter theory doesn’t come close to fully explaining government behavior (Minford, 1985; Wren, 1992; Levitt, 1996; Poole and Rosenthal, 1996). In fact, in a study of U.S. Senate voting, Steven Levitt (1996) found that a Senator’s ideology is more important in determining how she votes than are the views of her constituents. Minford (1985) has found that, contrary to the median voter theorem, political parties do differ in their policy behavior. Thus the two parties in my model illustrated in Figure 1 represent different constituencies with different preferences, and, as a result, have different utility functions.

In period 1, one risk-neutral party runs the first government, \( G_1 \). This party wants to undertake a project of variable size, \( v_1 \). This might be building new parks, a library, or a new fleet of tanks. In a perfectly competitive market, it contracts with a risk-neutral firm, \( F \), to build the project. In period 2, \( F \) begins to build a project of size \( v_1 \). I assume that if a new party controls the government in period 3, it will want to reduce the size of the project. While \( F \) is in the process of building, in period 3, a new election takes place. With probability \( q \), the other party, \( G_2 \), wins the election, and with probability \( 1 - q \), \( G_1 \) retains power.

If \( G_2 \) wins, in period 4 it will renegotiate the contract, via Nash bargaining, with \( F \) to reduce the size of the project and the price. The parties’ outside option is determined by \( G_2 \). It can breach the contract, meaning that the firm

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Figure 1. The Model.
does not build the project at all, and pay damages, \( D \), to \( F \). On the other hand, \( G_2 \) can choose to abide by the original contract of \( v_1 \) and \( p_1 \). Whichever of these \( G_2 \) prefers will be the outside option of both parties. Because the purpose of this article is to examine the effects of different damage measures, I assume that \( G_2 \) prefers breach. Of course, \( v_2 \) will be chosen to maximize the total surplus for \( F \) and \( G_2 \). In period 5, the firm completes the project and the government pays \( F \) according to whatever the final contract dictates.

In this model there is no discounting and no reason for breach of contract other than changing preferences (e.g., I rule out holdup considerations). In the real world, where other potential motives for breach may be present, the analysis in this article is not the last word on what damages should be, but it does provide insight into one important consideration that may be motivating breach. I define the following notation:

- \( v_i \)—the size of the project that \( G_i \) and \( F \) choose.
- \( p_i \)—the price \( G_i \) agrees to pay \( F \) for completing the project of size \( v_i \).
- \( C(v_i) \)—the cost of building the project for the firm. \( C'(v_i) > 0, C'' > 0 \).
- \( S(v_i - v_2) \)—the cost savings from cutting the project from \( v_i \) to \( v_2 \). Thus the net cost of building a project of size \( v_2 \), after \( G_1 \) has already contracted for a project of size \( v_1 \), is \( C(v_1) - S(v_1 - v_2) \). I assume this is always greater than \( C(v_2) \); there is some waste in starting to build a larger project and cutting it back later: \( S'(v_1 - v_2) > 0, S'' < 0 \). The savings function is concave because I assume that small reductions in the size of the project can be accomplished easier than large ones. I also assume \( S'' > 0 \) (a regularity condition).
- \( u_i(v) \)—the utility that \( G_i \) gets from a project of size \( v \). \( u'_i > 0, u''_i < 0 \).
- \( u_i'(v) > u_i'(v); u_i'(v) > u_i''(v) \forall v \). I also assume \( u''_i < 0 \) (a regularity condition).
- \( a \)—the utility cost for either government of a dollar in government spending when it is in power.
- \( \hat{a} \)—the utility cost for the first government of a dollar in government spending when the second government is in power. I assume that taxes are seen as less costly to the first government when it is not the party that is levying them, that is, \( \hat{a} \leq a \), since it will face less blame from higher taxes when not in power and because it thinks the second government will spend less wisely. As will become clear below, if the first government considers spending by a potential successor just as costly as its own spending, then damages for breach of contract will have no effect on the size of the project the first government chooses. The way damage

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8. I am ignoring the possibility of partial breach, for example, where \( G_2 \) tells \( F \) it will refuse delivery of more than 10 tanks. If the project is indivisible then partial breach is not a possibility (\( G_2 \) can’t tell \( F \) it will refuse delivery of the top 10 floors of a library). If partial breach is possible, then the results would apply to damages measures for partial breach. If \( G_2 \) can find another firm that can build the (smaller) project when there is a breach, then one can just relabel \( G_2 \)’s utility from breach as \( G_2 \)’s net utility (net of costs) from having to use an alternate supplier who must start from scratch.
measure affects the first government’s incentives is through its desire to get the second government to bear more of the costs of meeting the firm’s participation constraint.

$D$—the damages that $F$ is entitled to if $G_2$ breaches the contract in period 4.\footnote{I assume this is exogenous, that is, that $G_2$ cannot include in the law that authorizes the project the damages for breach. If $G_1$ did this, there is no reason why $G_1$ couldn’t just change this part of the law when they came to power. Then a court would have to decide if this change amounted to a taking that required compensation. At this point, the issue is again what should the court do with respect to damages and the analysis of the article is again relevant.}

$q$—the probability that $G_2$ wins the election in period 3.

I am assuming away the possibility that $G_1$ will want to renegotiate its own contract if it wins the election. I can rule out renegotiating for a larger project by assuming that increasing project size at that late date is very costly. There are, however, parameter values for which $G_1$ initially will choose a project, for strategic reasons, that is larger than the project it would want if it knew it would be reelected for sure. In such situations, it is possible that $G_1$ would want to renegotiate the size of the project downward after the election.\footnote{The reason $G_1$ still may elect to remain with the original contract is that cutting back the project after the election does not reduce its costs by as much as if the project had been originally designed to be smaller in the first place.}

This will induce $G_1$ to choose a larger initial project than it otherwise would. I show below that under reliance and expectation damages, even without this renegotiation, $G_1$ will always choose an initial project size that is larger than the social welfare optimum. This will also often happen with constant damages. Allowing the first government to renegotiate its own contract would only strengthen those results. I rule it out because it greatly complicates the analysis. (The fact that such renegotiation could occur in reality, however, does suggest an empirical test of the severity of the strategic opportunism that this article discusses. One could correlate the frequency and/or magnitude of a reelected government renegotiating a contract to reduce the size of a project with some estimate of the ex ante probability of it winning the election, which should vary across jurisdictions. It might also be possible to include the damage rule in the jurisdiction as a regressor if this is predictable.)\footnote{I am grateful to an anonymous referee for pointing this out.}

The main issue this article addresses is the comparison of the contract that an actual government will write and the contract that a benevolent social planner would write. I assume that neither the social planner nor the current government, $G_1$, can control $v_2$ and $p_2$ (chosen by $G_2$). The first step, then, is to examine $G_2$’s behavior should it win the election. If renegotiation fails, $G_2$ has two possible outside options. It can breach the contract, receiving utility of

\[ u_2(0) - aD \equiv \bar{U}_b. \] \footnote{$u_2(0)$ can be thought of as the utility associated with breaching and having another firm build the project that is of the second government’s ideal size.}
If it chooses not to breach the original contract it will receive a utility of

\[ u_2(v_1) - ap_1 \equiv \overline{U}_{ub}. \] (2)

As discussed above, I only consider the case when \( \overline{U}_b \geq \overline{U}_{ub} \).\(^{13}\) In the appendix I prove that when damages are so large that the second government prefers to abide by the contract rather than breach, the first government’s incentives are farther away from the social welfare optimum than under even reliance damages. Thus allowing the parties to specify damages in the contract will be the worst solution of all.

When \( G_2 \)’s preferred outside option is breach, its surplus from renegotiating the contract to \( v_2 \) and \( p_2 \) is

\[ u_2(v_2) - u_2(0) - a(p_2 - D) \equiv g. \] (3)

\( F \)’s surplus over the outside option of breach is as follows:

\[ p_2 - C(v_1) + S(v_1 - v_2) - [D - C(v_1) + S(v_1)] \equiv f. \] (4)

Under the new contract, \( F \) has revenue of \( p_2 \). Its costs are \( C(v_1) \) less \( S(v_1 - v_2) \), the savings from cutting the project to \( v_2 \). The terms in the square brackets are \( F \)’s profit from breach: it receives \( D \) but has costs of \( C(v_1) \) less its savings of \( S(v_1) \), since now it scales the project back to zero.

Since the renegotiation occurs via Nash bargaining, the new price, \( p_2 \), and project size are set to maximize \( gf \).\(^{14}\) Doing so gives the following conditions for \( p_2^* \) and \( v_2^* \):

\[ p_2^* = D + \frac{1}{2} \left[ S(v_1) - S(v_1 - v_2^*) \right] + \frac{1}{2a} \left[ u_2(v_2) - u_2(0) \right] \] (5)

\[ u_2'(v_2^*) = aS'(v_1 - v_2^*) \] (6)

Equation (6) is the condition that sets the second government’s marginal benefit equal to its marginal cost. This condition determines \( v_2^* \). Its marginal cost is just the firm’s marginal cost times \( a \), the utility cost of government spending. Since \( v_2^* < v_1 \), the firm’s marginal cost after the election is the amount it could save by scaling the project back a little more, \( S'(v_1 - v_2^*) \). As a result, the initial project size, \( v_1 \), will affect the marginal cost of, and thus the second government’s choice of, the final project size, \( v_2^* \). The following lemma examines the exact nature of this dependence.

\[ ^{13} \text{Whether this is the case or not will depend on } G_1 \text{’s choice of } v_1 \text{ and level of damages. However, when } G_1 \text{’s utility from the project is much smaller than } G_1 \text{’s, then this will certainly be the case so long as damages are substantially less than } p_1. \text{ When a court uses constant damages, then, the level of damages must not be so large as to change } G_1 \text{’s preferred outside option from breach to compliance. For either expectation or reliance damages this will hold if } S(v_1) \text{ is not too small.} \]

\[ ^{14} \text{The first-order conditions for this problem are } ap^* = g^* \text{ and } u_2'(v_2^*)f^* = g^*S'(v_1 - v_2^*). \]
Lemma 1. The larger is the initial size of the project, \( v_1 \), the larger will be the project size chosen by \( G_2, v_*^2 \), should it win the election in period 3. This effect, however, will be less than one for one; a unit increase in \( v_1 \) will cause less than a unit increase in \( v_*^2 \).

Proof of Lemma 1. Differentiate Equation (6) with respect to \( v_1 \) and rearrange terms:

\[
1 > \frac{dv_*^2}{dv_1} = \frac{aS''(v_1 - v_*^2)}{u_*^2(v_*^2) + aS''(v_1 - v_*^2)} > 0.
\]

\( dv_*^2/dv_1 \) is between zero and one because the utility and saving functions are both concave.

The firm has already done a lot in preparation for building the larger-scale project. So if \( G_2 \) asks \( F \) to build a much smaller project, it may have to drastically change its production plan. This results in greater waste relative to what the costs would have been had it planned on this much smaller project originally. Thus a larger \( v_1 \) reduces \( G_2 \)'s marginal cost of \( v_*^2 \), inducing a larger optimal choice of \( v_*^2 \). The effect is less than one for one since there are always still some savings from additional cutbacks.

Now that I have analyzed how \( G_2 \) will respond to the first period contract, I can compare the choice of project scale made by \( G_1 \) and a benevolent social planner. First, I must decide upon the utility function of the social planner. Most models that consider the behavior of the government either treat the government as a benevolent social planner or they model the government as just another utility maximizing agent with its own utility function. The first approach is clearly not feasible for this model, since I am taking into account that there are often two parties that desire to run the government with very different preferences. By necessity then I use the second approach. I assume that each party’s utility function is exactly the utility function of a particular fixed constituency in the population that it represents. I also assume that there exists a third constituency that is less dogmatic than either of the other two. As a result, a fraction \( r_1 \) of the population has preferences that are exactly the preferences of \( G_1 \). A fraction \( r_2 \) of the population has preferences that are exactly the preferences of \( G_2 \). The rest of the population has preferences that depend on the signal they receive about the state of the world. This signal can take on one of two values, 1 or 2. If it takes on value 1, then these people’s preferences become aligned with the first group, and if it takes on value 2, then these people become aligned with the second group. I assume that this third constituency is decisive in the election, that is, that \( r_1 < 0.5 \); \( r_2 < 0.5 \). I also assume that at the time the contract is signed, the probability that the signal will take on value 2 is \( q \). Thus the probability that the third constituency will vote for \( G_2 \), and thus \( G_2 \) will win the next election, is \( q \). (Notice that this is consistent with the assumption above about the probability of a change in government.)

These assumptions reflect the fact that while some portion of the population always supports one party or another (the Democrats or Republicans
in the United States), the same party doesn’t always win the elections. Thus there is a fairly large group of people who vary their support based on external signals. They may decide that the policies of the Democrats, for example, are more appropriate in certain situations, whereas Republican policies are more appropriate in others. Alternatively, it may be that they vary the party that they support based on the personal characteristics of the candidates. One way to view this is that some people align their preferences about policy issues with the preferences of candidates that they trust. Either view supports the idea that the outcome of an election does provide valuable information about the preferences of the electorate. A benevolent social planner will want to use this information in constructing optimal policies. Of course, unlike in my stylized model, elections will not perfectly reveal the preferences of the electorate. Since they often are the best proxy available, however, it is reasonable to assume that when the party in power changes, the fraction of citizens that support the policies of each party changes as well. My model captures this idea in a relatively straightforward fashion. The results of the article are not sensitive to the exact way in which population preferences vary with election results. The essential assumptions are that (1) the social planner will assume that if a new party wins an election, the preferences of the population must have changed in the direction of the preferences of that party; (2) the party in power before the election, on the other hand, wants to maintain its favored policies regardless of how the population preferences may change.

Given these assumptions, a social welfare function that gives equal weight to the preferences of everyone will be as follows:

\[
SW = (1 - q) \left( (1 - r_2)u_1(v_1) + r_2u_2(v_1) \right) + q \left( r_1u_1(v_2^*) + (1 - r_1)u_2(v_2^*) \right) - \{aC(v_1) - qaS(v_1 - v_2^*) \}.
\]

(8)

With probability \((1 - q)\), the signal will take value 1 and \(G_1\) will remain in power. When that happens, everyone, but a fraction \(r_2\) of the population, has a preference of \(u_1\), and the project size is the one negotiated in the original contract by \(G_1\), that is, \(v_1\). With probability \(q\), the signal will take the value 2, and \(G_2\) will win the election. In this case, everyone, but a fraction \(r_1\) of the population, has a preference of \(u_2\), and the project size is the one \(G_2\) renegotiates with \(F\), that is, \(v_2^*\), given the initial project size of \(v_1\). The terms in curly brackets describe the cost of the project. This is the cost of building a project of size \(v_1\) less any savings that result from scaling the project back when \(G_2\) wins the election, weighted by the probability of that event. Recall that the weight, \(a\), is the utility cost of government spending.

This social welfare function is quite different from how the first government, \(G_1\), actually chooses initial project size. \(G_1\) will consider how \(G_2\) will respond to the initial contract, but only in the context of how that affects its \((G_1)'s\) own utility. Thus \(G_1\)'s first period optimization problem is

\[
U_{G_1} = \max_{v_1, r_1} (1 - q)\left[ u_1(v_1) - aP_1 \right] + q\left[ u_1(v_2^*) - \hat{a}P_2^* \right].
\]

(9)
The first square bracket term in Equation (9) represents $G_1$'s net utility when it wins the election; this happens with probability $(1 - q)$. With probability $q$, $G_1$ will lose the election. Then $G_2$ will renegotiate the contract, making the final project scale $v^*_2$ and the price $p^*_2$. The second square bracket term in Equation (9) is $G_1$'s utility from this outcome. $G_1$ maximizes this subject to $G_2$'s optimal response functions $v^*_2$ and $p^*_2$ and $F$'s participation constraint; the firm must make zero profits in expectation:

$$
(1 - q)p_1 + q p^*_2 - C(v_1) + q S(v_1 - v^*_2) = 0.
$$

(10)

The objectives of the incumbent government differ from those of a social planner in two important ways. First, it holds to its preferences regardless of the outcome of the election. Thus it wants a large project even if it loses the election. Second, it wants its potential successor to have to bear as much of the cost of meeting the firm's participation constraint as possible. It achieves this first objective by choosing a larger initial project than would a social planner (because the marginal cost of project size to the second government is decreasing in initial project size). The second objective is achieved by increasing the price the second government has to pay when it renegotiates the contract. To do this, the first government wants to strengthen the bargaining power of the firm vis-à-vis the second government if the contract is renegotiated. The only way it can do that is by affecting the value of the outside option to the firm. When there are no damages (or constant damages) for breach of contract the firm does better, in the event of breach, the smaller the project.

Thus the first government's incentives, relative to the social planner's, with respect to project size are in conflict. On the one hand, to influence future policy, it wants to choose a larger project. But to force its rival to bear a larger portion of the expense, it wants a smaller policy. The first incentive will dominate when it is very effective (when increases in the initial project size are strongly correlated with increases in the project size chosen by the second government, i.e., $dv^*_2/dv_1$ is close to one) and when it is very important (the preferences of the second government differ greatly from the preferences of the first). This is the essence of the first proposition.

**Proposition 1.** If damages are independent of $v_1$, there is a critical value, $dv^*_2/dv_1 < 1$, such that if $dv^*_2/dv_1 > d\bar{v}^*_2/dv_1$, then $v_1$ will be above its first best value. If $dv^*_2/dv_1 < d\bar{v}^*_2/dv_1$, then $v_1$ will be below its first best value.\(^{16}\)

\(^{15}\) Even for projects that decay before the next election, $G_1$ will still choose a larger project than a social planner because it would ignore the preferences of the fraction of the population, $r_1$, that always support the second governments policies. If swing voters represent a substantial portion of the population, however, this inefficiency will be quite small relative to the one in the model. Moreover, there is nothing contract law can do about it.

\(^{16}\) There is also a critical value of $dv^*_2/dv_1$ that determines when $v_1$ is greater than the level $G_1$ would choose if it didn’t face electoral competition. This critical value is strictly larger (for $r_1$ not too large) than the critical value in Proposition 1.
The greater the difference between the two governments in their marginal utility from project size (assuming this difference is equal at \( v_1 \) and \( v_2^* \)), the smaller is the critical value, \( \frac{dv_2^*}{dv_1} \).

**Proof.** See appendix.

When an incumbent party faces an electoral challenge from a party with which it has strong ideological disagreements, the incumbent party is more likely to use long-term contracts to try to lock in its policies in case it is not reelected. Thus, unless damage rules exist to mitigate this problem, challenging parties will be less able to carry out their policies. This is an unfortunate result, since the greater the ideological differences between the two parties, the more important elections are to ensure that the will of the people is given effect. Using damage rules to mitigate the incumbent’s ability to limit the flexibility of the challenging party is especially important in these situations.

4. Damage Measures

Unfortunately traditional damage measures (reliance and expectation damages) exacerbate, rather than mitigate, this problem. Recall that the reliance damage measure gives the party that suffers from the breach the amount it spent in reliance on the contract. Expectation damages give the nonbreaching party the benefit of the bargain, that is, they give the nonbreaching party the profit it would have had if the contract were performed. As I discussed above, most government contracts are governed by a “termination for convenience” provision. Because damages under this provision are very similar to reliance damages, the reliance damages results will also apply to damages under “termination for convenience.”

In this context, reliance damages, \( D_R \), would be the costs \( F \) incurred in building the project less the amount that \( F \) could save when \( G_2 \) cancels the project.

\[
D_R = C(v_1) - S(v_1)
\]

\[
\frac{dD_R}{dv_1} = C'(v_1) - S'(v_1) > 0
\]

This expression is positive because of the (quite reasonable) assumption that there is more inefficiency in canceling a larger project than a smaller one. (The savings function is concave and the cost function is convex. I assume that for any size project it is always cheaper to plan to build this size project originally than to plan on a larger project and cut it back later. As a result, the marginal cost of building a project is always greater than the marginal

\[17\] As Fischel and Sykes (1999) put it, “after a termination for convenience, the contractor is entitled to an action for the price on work completed, actual costs incurred plus a reasonable allowance for profit on partially completed work, and nothing whatsoever on work not yet begun (thus, no lost profits on such work).” The exact details can be found in 48 C.F.R. 52.249-2.
savings from scaling it back to nothing.) Even though $F$ can recover some of its costs when $G_2$ breaches, it is natural to expect that it will have more nonrecoverable costs the larger the project it was building. As a result, the larger the project that $G_1$ contracts with $F$ to build, the more damages $G_2$ will be required to pay $F$ should it choose to breach the contract. This ensures that larger projects result in $G_2$ bearing a greater proportion of the cost of meeting $F$’s participation constraint. Thus, if $v_1$ is above its first-best value without considering the damage rule term, using reliance damages will only exacerbate the distortion. In fact, I will prove below that when a court uses reliance damages, the initial project size is always greater than its first-best level.

The formula for expectation damages is slightly more complicated. When the contract is performed the firm’s profit is as follows:

$$p_1 - C(v_1). \quad (13)$$

When $G_2$ breaches, the firm’s profit is

$$D + S(v_1) - C(v_1). \quad (14)$$

As a result, the level of damages that equates these two is the expectation damage measure:

$$D_E = p_1 - S(v_1). \quad (15)$$

Just as it does better in preventing holdup, the expectation damage measure performs better than reliance damages in this model as well, though for very different reasons. However, even expectation damages always induce $G_1$ to choose a socially excessive project scale.

**Proposition 2.** Under both reliance damages and expectation damages, the initial project scale, $v_1$, will be both larger than under constant damages and larger than the first-best project scale. The project scale chosen by $G_1$ under expectation damages, however, will always be smaller than the project scale chosen by $G_1$ under reliance damages. 18

**Proof.** See appendix.

When damages do not vary with $v_1$, a larger $v_1$ can hurt $F$’s bargaining position with $G_2$ because it reduces the savings $F$ can get from scaling back the project any given amount. If this effect is larger than the effect of $v_1$ on $v^*_2$, $G_2$’s optimal project size, then larger $v_1$ will reduce the price $G_2$ will pay.

18. The result is somewhat different if courts do not consider opportunity costs, but rather measure costs by looking only at accounting costs. In this case, courts will neglect some of the costs associated with building a larger project. Thus accounting cost reliance damages do not increase as fast with initial project size. With expectation damages, ignoring opportunity costs overestimate the firm’s true economic profit. Since opportunity costs rise with the scale of the project, this magnifies the damages’ dependence on $v_1$. So the welfare comparison between reliance and expectation damages that holds when courts accurately assess costs will not always hold when courts use only accounting costs.
This induces $G_1$ to lower $v_1$, since it would rather have $G_2$ bear a larger portion of the burden of meeting $F$’s participation constraint. When $F$ is compensated by either reliance or expectation damages for breach, however, this first effect is absent. Larger $v_1$ does not hurt $F$’s bargaining position since it receives damages from contract breach that increase with $v_1$ faster than scaling back the project reduces marginal savings. So there is nothing to counteract $G_1$’s private benefit (which is not a social benefit) from increasing $v_1$ so as to increase $v_2^*$ should it lose the election. Thus both damage measures induce $G_1$ to choose an initial project size that is larger than what is socially optimal. Because “termination for convenience” damages have such a strong reliance component, they will still increase with initial project size almost as much as do reliance damages. So even though they may, in some cases, be absolutely lower than reliance or expectation damages, they still suffer from the same defects.

The reason that expectation damages perform better than reliance damages stems from how the firm’s participation constraint is met, and the fact that expectation damages compensate $F$ for lost profits rather than lost costs. While the ex ante market for firms is competitive, if the contract is renegotiated (following a $G_2$ victory in period 3), the firm is in a bilateral monopoly situation, so it will receive some surplus. To break even, the firm requires a first-period price that covers its costs less the expected value of its share of the surplus from renegotiating with $G_2$ should $G_2$ win the election. The surplus available from renegotiating is larger the larger the project is, because breaching larger contracts is more wasteful. Again, the assumption that drives this result is the concavity of the savings function. Thus first-period price increases with project size more slowly than do costs themselves. Notice that expectation damages compensate the firm for its losses relative to the performance of the original contract, at the original price, rather than its losses relative to the expected renegotiated contract. As a result, the firm’s compensation from breach will not vary as much with initial project size as it would were it compensated for its costs, as it is under reliance damages.

$$p_1 = C(v_1) - \frac{q}{2a} [u_2(v_2^*) - u_2(0) - a[S(v_1) - S(v_1 - v_2^*)]] \quad (16)$$

$$\frac{dD_E}{dv_1} = \frac{dp_1}{dv_1} - S'(v_1)$$

$$= C'(v_1) - S'(v_1) - \frac{q}{2} [S'(v_1 - v_2^*) - S'(v_1)] \leq \frac{dD_R}{dv_1} \quad (17)$$

This means that with expectation damages instead of reliance damages, the price that $F$ will receive from $G_2$ will increase with initial project size, but not as fast as under reliance damages. Since $G_1$ wants to increase the price that $F$ can get from $G_2$, it has a smaller incentive to increase $v_1$ under expectation damages than under reliance damages.
The intuition underlying Proposition 2 is somewhat similar to the intuition underlying the standard excessive reliance results of Shavell (1980) and Rogerson (1984). Reliance damages, and to a lesser extent expectation damages, make increases in project size cheaper (per unit) for the first government, just as they make noncontractible reliance investments cheaper in the standard model. By making project size or reliance investment cheaper, they induce more of it. The difference is that in this model the source of the distortion is not that there is an important noncontractible element, but rather that there is an unrecognized externality: an administration may be forced to become a party to a contract that it didn’t negotiate.

What Proposition 2 says is that no matter how big or small the ideological differences between the parties, and no matter what the properties of the savings and utility functions, reliance and expectation damages increase too rapidly with the initial size of the project. This gives $G_1$ the incentive to increase $v_1$ in order to both push some of the costs of compensating $F$ onto $G_2$ and to get the final project size closer to its ideal level. When constant damages yield an initial project scale above the first-best level, Proposition 2 says that reliance and expectation damages will perform even worse. If the initial project size with constant damages is too small, the model does not provide a way to judge whether it still provides better incentives. However, the proof of this proposition does suggest that even then constant damages are likely to be superior to reliance damages. The reason is that the difference between the first-order condition of social planner and the first government (what I call the distortion term) will be smaller in absolute magnitude under constant damages than under reliance damages. While a larger magnitude distortion term is not the same as lower total social welfare, it certainly suggests it. And this is the best-case scenario for reliance damages in their comparison with constant damages.

While the same argument does not work when comparing constant damages to expectation damages, I suspect that for almost all parameter values the result will be the same. However, several conditions would have to be met for this term to make the expectation damages distortion smaller in magnitude than the constant damages distortion. Unless the first government

---

19. From Equation (A11), I can write

\[
\text{distortion}_{k} > q \frac{dv^*_2}{dv_1} (1 - r_1)(a'_1(v_1^*) - a'_2(v_2^*)) + (1 - q)r_2[a'_2(v_1) - a'_2(v_1)]
+ q(a - \hat{a}) \left( \frac{S'(v_1 - v_2^*) - S'(v_1)}{2} + \frac{dv^*_2}{dv_1} S'(v_1 - v_2^*) \right) > q(a - \hat{a}) \frac{S'(v_1 - v_2^*) - S'(v_1)}{2}
= \left| q(a - \hat{a}) \frac{S'(v_1 - v_2^*) - S'(v_1)}{2} \right| > \text{distortion}_{k} \text{ when this distortion term is negative.}
\]

20. The reason the above argument fails for expectation damages is that the expectation damages distortion term is the reliance damage distortion term less $q^2(a - \hat{a}) (S'(v_1 - v_2^*) - S'(v_1)/2).$
is almost sure to lose the election \((q \text{ near one})\), initial project size has very little effect on final project size \((dv^2/dv_1 \text{ near zero})\), and the parties’ differences in marginal utility \(u'_1(v^*_1) - u'_2(v^*_2)\) are quite small, the expectation damages distortion will be larger than the constant damages distortion. (This applies when the constant damages distortion is negative; the expectation damages distortion is always greater when the constant damages distortion is positive). The cases where expectation damages perform better than constant damages in preventing this type of intergovernment opportunism should be few and far between.

5. Conclusion

As discussed above, there is a substantial literature explaining why democratically elected governments will not always enact policies that maximize the welfare of society. This article explores one mechanism, long-term contracts, by which government may act opportunistically to entrench its favored policies at the expense of the ability of the electorate to mandate new policies. More importantly, the article shows that the legal rules traditionally used for breach of contract often magnify this problem. The statutory alternative, “termination for convenience,” not surprisingly, is no improvement. In particular, the article demonstrates that reliance damages are not well suited to government breach of contract. They produce an initial project size that is larger than what one gets with constant damages, and it is always above the social optimum. Because of its similarity to reliance damages, damages under the “termination for convenience” provision suffer from the same defect. The article also demonstrates that while expectation damages may perform slightly better than reliance damages (for dealing with strategic opportunism due to preference changes), they will still generate greater distortions than a constant damage rule.

The model in the article assumed that the rate at which the project could be completed was fixed. Often, however, the firm may be able to increase the amount of the project it can complete before the election (I call this front-loading), though at greater cost. This might be attractive to the first government because it reduces the amount the second government can save by scaling back the project (more of the costs of the project are sunk). Thus, given any initial project size, the ultimate size of the project should the second government take power will be larger the more the project is front-loaded. Allowing the first government and the firm the option to contract over the degree of front-loading as well as the size of the project does not alter the relative merits of constant versus reliance versus expectation.

To see this, note that the first government’s marginal incentive to front-load is strictly greater under reliance or expectation damages than under constant damages. (Reliance and expectation damages depend positively on costs, which increase with front-loading, and negatively on savings, which decrease
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Because of this greater incentive to front-load, the welfare comparisons between constant damages and reliance and expectation damages are identical to what they were when front-loading was not possible. Notice that because front-loading is costly, it can only increase social welfare if it induces the first government to choose an initial project size that is closer to the choice a social planner would make. Assume that constant damages induce the first government to choose an initial project size that is too large, which (as discussed above) will often, though not always, be the case. Then front-loading must decrease initial project size to be welfare improving. Moving from constant damages to reliance or expectation damages, however, increases the first government’s marginal benefits for both initial project size and front-loading. Thus, as was the case without front-loading, moving from constant damages to reliance or expectation damages can never improve social welfare if constant damages already generate an excessive initial project scale.

The problem is that neither of these traditional damage rules give the original contracting parties any incentive to consider the fact that the new government may have different preferences from the current one. In fact, both of these damage measures reward the firm more, the more the original contract induces $G_2$ to choose a project scale closer to $G_1$’s ideal. This is not accidental. These damage measures are designed to prevent a breaching party from holding up its contracting partner, not from holding up a later incarnation of itself with different preferences. As a result, they are designed to protect the nonbreaching party and thus generate a (partially, at least) effective commitment against holdup. But when the identity of one party changes, thus changing the preferences of that party, the threat of breach is not purely opportunistic holdup. So it is not optimal to have damage measures that make this threat of breach less effective.

What one needs to solve the problem is a damage rule that does not increase the damage award so much when the initial project scale increases. In fact, if the initial size of the project will be excessive, even before considering the damage rule, the ideal damage rule will be decreasing in $v_1$. The rule that eliminates the distortion entirely, call this damage measure $D^*$, is

\[ \frac{dD^*}{df} = C_2(v_1; f) - \frac{q}{2} \left\{ S_2(v_1 - v^*_2; f) - S_2(v_1; f) \right\} > 0. \]

Formally, $dD^*_R/df = C_2(v_1; f) - S_2(v_1; f) > 0$ and

\[ \frac{dD^*_E}{df} = C_2(v_1; f) - \frac{q}{2} \left\{ S_2(v_1 - v^*_2; f) - S_2(v_1; f) \right\} \]

\[ = C_2(v_1; f) - \left( 1 - \frac{q}{2} \right) S_2(v_1; f) - \frac{q}{2} S_2(v_1 - v^*_2; f) > 0. \]

21. Formally, $dD^*_R/df = C_2(v_1; f) - S_2(v_1; f) > 0$ and

\[ \frac{dD^*_E}{df} = C_2(v_1; f) - \frac{q}{2} \left\{ S_2(v_1 - v^*_2; f) - S_2(v_1; f) \right\} \]

\[ = C_2(v_1; f) - \left( 1 - \frac{q}{2} \right) S_2(v_1; f) - \frac{q}{2} S_2(v_1 - v^*_2; f) > 0. \]

22. It is possible to formalize this argument. Doing so requires making some restrictions on the savings function to ensure that second-order conditions are satisfied, and is not very illuminating.
defined by the following differential equation:

\[
\frac{dv^*_2}{dv^*_1} \left[ u'_1(v^*_1) - \hat{a}S'(v^*_1 - v^*_2) \right] + (a - \hat{a}) \left[ \frac{S'(v^*_1) - S'(v^*_1 - v^*_2)}{2} + \frac{dD^*}{dv^*_1} \right] = 0. \quad (18)
\]

The left-hand side is the distortion term from Equation (A11). Solving this differential equation to get a solution for \(D^*\), however, will not provide a meaningful damage rule that a court can apply. The solution will require a court to know the exact form of the functions \(S\), \(u_1\), and \(u_2\), and the parameters \(a\) and \(\hat{a}\). While a court may be able to reasonably estimate the \(S\), since it is a function of the technology, the remaining functions and parameters all come from the preferences of the parties.

A more technically feasible solution is for a court to use the guidelines that follow Proposition 1 to estimate if initial project size with constant damages is likely to be excessive. If it concludes that it is, maybe because the two political parties have large ideological differences on the issue, the court could use constant damages. This, however, requires a court to choose damages based on its reading of the political situation, which would be highly controversial. I suspect courts would be hesitant to follow this proposal.

Perhaps the only possible way to mitigate the problem outlined in this article is to create a new damage rule, replacing the “termination for convenience” rule, that would apply whenever the government breaches a contract (or, if it can be described precisely enough, whenever the government breaches a contract signed by its predecessor). This damage rule should be some weighted average of constant damages and expectation damages. The weights could be chosen to balance holdup concerns with intergovernment opportunism concerns. Such a rule would mitigate the effect of initial project size on damages, thus reducing the opportunism between governments. Moreover, by replacing “termination for convenience,” it would eliminate this reliance-like damage measure that performs worse than expectation damages in preventing holdup and intergovernment opportunism. Unfortunately an existing government has little incentive to adopt such a law since it only limits its own power to commit future governments.

For efficient marginal incentives, it does not matter what the level of constant damages are, so long as they do not depend on the initial project size. However, if the damages are too large, the second government’s best outside option will be to abide by the original contract rather than to breach. This will further distort the first government’s incentive to choose a larger initial project size.

Another inframarginal reason to limit constant damages relates to distortions in a government’s decision to contract out a project to the private sector. If the government performs the task internally, its successor will not have to negotiate with the firm to change the size of the project, under the shadow of a required damage payment if it breaches. If, however, the government contracts with a private firm to build the project, then the threat of damages
for breach will force a successor regime to share more of the surplus from renegotiation. As I have discussed above, this reduces the price an incumbent government must pay to induce a private firm to build the project. If this effect is strong enough, for example, if the government thinks it is likely not to be reelected, the government may decide it is cheaper for them to contract out a project, even if it would be more efficient to build the project internally.

Appendix

Proof of claim that when \( G_2 \) prefers the initial contract to breach, \( G_1 \)'s incentives are worse. If \( \bar{U}_{ab} > \bar{U}_b \), then the price after renegotiation will be as follows:

\[
p_2^* = p_1 - \frac{S(v_i - v_2^*)}{2} - \frac{u_2(v_i) - u_2(v_2^*)}{2a}. \tag{A1}
\]

From \( F \)'s participation constraint, Equation (10), one can write

\[
p_1 = \frac{C(v_i) - qS(v_i - v_2^*) - qp_2^*}{1 - q}. \tag{A2}
\]

Substituting Equation (A2) into Equation (A1) yields

\[
p_2^* = C(v_i) - \left( \frac{1 + q)S(v_i - v_2^*)}{2} - \frac{(1 - q)[u_2(v_i) - u_2(v_2^*)]}{2a} \right). \tag{A3}
\]

Differentiating Equation (A3) with respect to \( v_1 \), rearranging terms, and using Equation (6), \( u_2'(v_2^*) = aS'(v_i - v_2^*) \), gives

\[
\frac{dp_2^*}{dv_1} = C'(v_i) - S'(v_i - v_2^*) \left[ \frac{(1 + q)S(v_i - v_2^*)}{2} - \frac{dv_2^*}{dv_1} \right] - \frac{(1 - q)u_2'(v_i)}{2a}. \tag{A4}
\]

This can be rewritten as

\[
\frac{dp_2^*}{dv_1} = C'(v_i) - S'(v_i - v_2^*) + \frac{(1 - q)}{2} \left[ S(v_i - v_2^*) - \frac{u_2'(v_i)}{a} \right] + \frac{dv_2^*}{dv_1} S'(v_i - v_2^*). \tag{A5}
\]

This is strictly greater than the affect initial project size has on \( p_2^* \) under reliance damages:

\[
\frac{dp_2^*}{dv_1} \bigg| \text{Reliance} = C'(v_i) - S'(v_i - v_2^*) + \frac{dv_2^*}{dv_1} S'(v_i - v_2^*) - \frac{S'(v_i - v_2^*) - S'(v_i)}{2}. \tag{A6}
\]

This ensures that \( G_1 \)'s marginal utility from \( v_i \) will be strictly positive at the \( v_i \) from reliance damages when \( \bar{U}_{ab} > \bar{U}_b \). To show this, I get \( G_1 \)'s first-order condition (using its objective function, Equation (9), and substituting
for \( p_i \) using Equation (A2)), which is zero under reliance damages when evaluated at the \( v_i \) from reliance damages. The only term that differs when \( G_i \)’s outside option is to honor the contract is the \( dp^*_i/dv_i \) term. Since this is greater in this case, \( G_i \) will choose a larger initial project size than under reliance damages.

\[
\frac{dU_{G_i}}{dv_i} = (1 - q)u'_i(v_i) + qu'_z(v^*_z) - aC'(v_i) \\
+ q \frac{dv^*_z}{dv_i} [u'_i(v^*_z) - u'_z(v^*_z)] + q(a - \hat{a}) \frac{dp^*_z}{dv_i}
\]

(A7)

Proof of Proposition 1. Using Equation (6), the first-order condition for the social planner’s problem, Equation (8), can be written as follows:

\[
(1 - q)u'_i(v_i) + qu'_z(v^*_z) - aC'(v_i) \\
+ \left[ qr_i \frac{dv^*_z}{dv_i} [u'_i(v^*_z) - u'_z(v^*_z)] - (1 - q)r_2 [u'_i(v_i) - u'_z(v_i)] \right] = 0.
\]

(A8)

To see how this differs from \( G_i \)’s first-order condition for initial project size, first substitute for the prices and \( F \)’s participation constraint in \( G_i \)’s objective function.

\[
U_{G_i} = \max_{v_i} (1 - q)u_i(v_i) + qu_i(v^*_z) - aC(v_i) + aqS(v_i - v^*_z) \\
+ q(a - \hat{a}) \left\{ \frac{u_2(v^*_2) - u_2(v^*_2)}{2a} + \frac{S(v_i) - S(v_i - v^*_z)}{2} + D \right\}.
\]

(A9)

The first-order condition\(^{23}\) for this problem is as follows:

\[
0 = (1 - q)u'_i(v_i) + qu'_z(v^*_z) - aC'(v_i) + q \frac{dv^*_z}{dv_i} [u'_i(v^*_z) - \hat{a}S'(v_i - v^*_z)] \\
+ q(a - \hat{a}) \left\{ \frac{S'(v_i) - S'(v_i - v^*_z)}{2} + \frac{dD}{dv_i} \right\}.
\]

(A10)

To determine the extent to which \( G_i \)’s incentives are distorted away from the socially optimal incentives, I subtract the left-hand side of the first-best first-order condition from the left-hand side of \( G_i \)’s first-order condition. I will refer to this as the distortion term for \( v_i \):

\[
\text{distortion} = q \frac{dv^*_z}{dv_i} (1 - r_i) [u'_i(v^*_z) - u'_z(v^*_z)] + (1 - q)r_2 [u'_i(v_i) - u'_z(v_i)] \\
+ q(a - \hat{a}) \left\{ \frac{S'(v_i) - S'(v_i - v^*_z)}{2} + \frac{dv^*_z}{dv_i} S'(v_i - v^*_z) + \frac{dD}{dv_i} \right\}.
\]

(A11)

\(^{23}\) The second-order conditions are discussed in the end of the appendix.
Set the distortion term, Equation (A11), equal to zero and solve for \( dv^*_v/dv_i \):

\[
\frac{dv^*_v}{dv_i} = \frac{q(a - \tilde{a})S'(v_i - v^*_v) - (1 - q)r_2[u'_i(v_i) - u'_v(v_i)]}{q[u'_i(v^*_v) - \tilde{a}S'(v_i - v^*_v)] - r_1[u'_i(v^*_v) - w'_i(v^*_v)]} \quad \Leftrightarrow \\
\frac{dv^*_v}{dv_i} = \frac{(a - \tilde{a})[S'(v_i - v^*_v) - S'(v_i)]}{2\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]} - \frac{(1 - q)r_2[u'_i(v_i) - u'_v(v_i)]}{q\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]}.
\]

(A12)

Using Equation (6) and rearranging terms, this can be rewritten as follows:

\[
\frac{dv^*_v}{dv_i} = \frac{(a - \tilde{a})[S'(v_i - v^*_v) - S'(v_i)]}{2\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]} - \frac{(1 - q)r_2[u'_i(v_i) - u'_v(v_i)]}{q\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]}. 
\]

(A13)

Since the distortion term is monotonically increasing in \( dv^*_v/dv_i \), it follows that the distortion term will be positive (negative) when \( dv^*_v/dv_i > 0 \) and \( dv^*_v/dv_i < 0 \) and so \( v_i \) will be greater (smaller) than its first-best value. The denominator for both terms is strictly positive since \( \tilde{a} < a \) and \( r_1 < 0.5 \). The first term is strictly less than one since the denominator is larger than the numerator (the numerator is strictly positive since \( S \) is concave). So since the second term is negative, \( dv^*_v/dv_i < 0 \).

To show that \( dv^*_v/dv_i \) is decreasing in the difference marginal preferences, I need to assume that this difference is equal at \( v_i \) and \( v_j \). I rewrite Equation (A13) as follows:

\[
\frac{dv^*_v}{dv_i} = \frac{(a - \tilde{a})[S'(v_i - v^*_v) - S'(v_i)]}{2\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]} - \frac{(1 - q)r_2[u'_i(v_i) - u'_v(v_i)]}{q\left[(1 - r_1)[u'_i(v^*_v) - u'_v(v^*_v)] + (a - \tilde{a})S'(v_i - v^*_v)]\right]}. 
\]

(A14)

First, define \( \Delta \equiv u'_i(v_i) - u'_v(v_i) = u'_i(v^*_v) - u'_v(v^*_v) \). Then differentiate \( dv^*_v/dv_i \) with respect to \( \Delta \). After simplifying, the result becomes

\[
\frac{d}{d\Delta}\left(\frac{dv^*_v}{dv_i}\right) = -(a - \tilde{a})\left[2(1 - q)r_2S'(v_i - v^*_v)
+ q(1 - r_1)[S'(v_i - v^*_v) - S'(v_i)]\right]
\times 2q\left[(1 - r_1)\Delta + (a - \tilde{a})S'(v_i - v^*_v)\right]^{-1} < 0. 
\]

(A15)

**Proof of Proposition 2.** First, I will prove the results dealing with reliance damages. The distortion term for reliance damages is the distortion term for constant damages with one extra positive term: \( (a - \tilde{a})(C'(v_i) - S'(v_i)) \). A
larger distortion term implies a larger initial project size. Reliance damages produce a \( v_1 \) above the first-best level since the distortion is positive:

\[
\text{distortion} \bigg|_R = q \frac{dv_1^*}{dv_1} (1 - r_1) \left\{ u_1'(v_1^*) - u_2'(v_1^*) \right\} \\
+ (1 - q) r_2 \left\{ u_1'(v_1) - u_2'(v_1) \right\} + q(a - \hat{a}) \\
\times \left\{ \frac{S'(v_1) - S(v_1 - v_2)}{2} + \frac{dv_1^*}{dv_1} S'(v_1) + C'(v_1) - S'(v_1) \right\} \\
> q \frac{dv_1^*}{dv_1} (1 - r_1) \left\{ u_1'(v_1) - u_2'(v_1) \right\} + (1 - q) r_2 \left\{ u_1'(v_1) - u_2'(v_1) \right\} \\
+ q(a - \hat{a}) \left\{ \frac{S'(v_1 - v_2) - S'(v_1)}{2} + \frac{dv_1^*}{dv_1} S'(v_1 - v_2) \right\} > 0. \quad \text{(A16)}
\]

The second line is smaller than the first since \( C'(v_1) > C'(v_1 - v_2) > S'(v_1 - v_2) \). When the distortion term is positive, \( v_1 \) is larger than its first-best value.

Turning now to the expectation damages results. Expectation damages depend on \( p_1 \), which is given by the participation constraint, Equation (10). After substituting for \( p_2^* \), from Equation (5), and \( D \), the participation constraint is

\[
[p_1 - C(v_1)] + q \left\{ \frac{u_2(v_1^*) - u_2(0)}{2a} - \frac{[S(v_1) - S(v_1 - v_2)]}{2} \right\} = 0 \Rightarrow \\
p_1 = C(v_1) - \frac{q}{2a} \left\{ u_2(v_1^*) - u_2(0) - a[S(v_1) - S(v_1 - v_2)] \right\} \quad \text{(A17)}
\]

\[
\frac{dp_1}{dv_1} = C'(v_1) - \frac{q}{2a} \left\{ \frac{dv_1^*}{dv_1} \left[ u_2' - aS'(v_1 - v_2) \right] - a \left[ S'(v_1) - S'(v_1 - v_2) \right] \right\} \\
= C'(v_1) - \frac{q}{2} \left[ S'(v_1 - v_2) - S'(v_1) \right]. \quad \text{(A18)}
\]

Taking the derivative of the formula for expectation damages, Equation (23), with respect to \( v_1 \):

\[
\frac{dD_E}{dv_1} = \frac{dp_1}{dv_1} - S'(v_1) \\
= C'(v_1) - S'(v_1) - \frac{q}{2} \left[ S'(v_1 - v_2) - S'(v_1) \right] < \frac{dD_R}{dv_1}. \quad \text{(A19)}
\]

From this it follows that

\[
[\text{Distortion}]_E < [\text{Distortion}]_R. \quad \text{(A20)}
\]
By Proposition 1, expectation damages generate a smaller $v_1$ than do reliance damages. The level of $v_1$, however, is still above the first-best level since

$\{\text{Distortion}\} = q \left\langle \frac{dv_2^*}{dv_1} \{u_1'(v_2^*) - \hat{a}S'(v_1 - v_2^*)\} + (a - \hat{a}) \right.$

$\times \left\{ \frac{(1 + q)[S'(v_1) - S'(v_1 - v_2^*)]}{2} + [C'(v_1) - S'(v_1)] \right\} \right.$

$\left. = q \left\langle \frac{dv_2^*}{dv_1} \{u_1'(v_2^*) - \hat{a}S'(v_1 - v_2^*)\} + (a - \hat{a}) \right.$

$\times \left\{ C'(v_1) - S'(v_1 - v_2^*) \right.$

$\left. + \frac{[2 - (1 + q)]S'(v_1 - v_2^*) - S'(v_1)]}{2} \right\} > 0 \quad (A21)$

Second-Order Conditions

First-Best Problem. The second derivative of the social welfare function is

$- (1 - q) r_2 [u_1'(v_1) - u_2'(v_1)] + qr_1 \left( \frac{dv_2^*}{dv_1} \right)^2 [u_1'(v_2^*) - u_2'(v_2^*)]$

$+ qr_1 \left[ \frac{d}{dv_1} \left( \frac{dv_2^*}{dv_1} \right) \right] [u_1'(v_2^*) - u_2'(v_2^*)]$

$+ (1 - q) u_1''(v_1) + q u_2''(v_2^*) \frac{dv_2^*}{dv_1} - aC''(v_1)$

$= (1 - q) [(1 - r_2)u_1'(v_1) + r_2 u_2'(v_1)]$

$+ q \left( \frac{dv_2^*}{dv_1} \right) \left[ r_1 u_1''(v_2^*) + \left( 1 - r_1 \frac{dv_2^*}{dv_1} \right) u_2''(v_2^*) \right]$

$+ qr_1 \left[ \frac{d}{dv_1} \left( \frac{dv_2^*}{dv_1} \right) \right] [u_1'(v_2^*) - u_2'(v_2^*)] < 0. \quad (A23)$

This follows because the utility functions are concave; $q$, $r_1$, $r_2$, and $\frac{dv_2^*}{dv_1}$ are between 0 and 1; and

$\frac{d}{dv_1} \left( \frac{dv_2^*}{dv_1} \right) = aS'' \left( 1 - \frac{dv_2^*}{dv_1} \right) u_2'' - aS'' \frac{dv_2^*}{dv_1} u_2'' < 0. \quad (A24)$
Actual Contracting Problem. The second derivative of the $G_1$'s objective function is

$$ q \left\{ u_z^2 S_{11} \left( 1 - \frac{dv^z_i}{dv_i} \right) - u_z^w S_{11} \frac{dv^z_i}{dv_i} \right\} L $$

$$ + \left( \frac{dv^z_i}{dv_i} \right)^2 u_i''(v_i^z) + \frac{1 - \frac{dv^z_i}{dv_i}}{2} S_{11} \left[ \left( a - \hat{a} \frac{dv^z_i}{dv_i} \right) + \hat{a} \left( 1 - \frac{dv^z_i}{dv_i} \right) \right] $$

$$ + \frac{a - \hat{a}}{2} S_{11}(v_i) + (a - \hat{a}) \frac{d^2 D_k}{dv_i^2} - a C_{11} + (1 - q) u_i''(v_i). \quad (A25) $$

$K = a/(u_z'^2 + a S_{11}) > 0$ and $L = [u_i'(v_i^z) - \hat{a} S_1] > 0$. For constant damages Equation (A25) is guaranteed to be negative so long as $S_{11} > 0$ and $u_z'^2 < 0$. With reliance damages Equation (A25) becomes

$$ q \left\{ u_z^2 S_{11} \left( 1 - \frac{dv^z_i}{dv_i} \right) - u_z^w S_{11} \frac{dv^z_i}{dv_i} \right\} L + \left( \frac{dv^z_i}{dv_i} \right)^2 u_i''(v_i^z) $$

$$ + \frac{1 - \frac{dv^z_i}{dv_i}}{2} S_{11} \left[ \left( a - \hat{a} \frac{dv^z_i}{dv_i} \right) + \hat{a} \left( 1 - \frac{dv^z_i}{dv_i} \right) \right] + \frac{a - \hat{a}}{2} S_{11}(v_i) $$

$$ + (a - \hat{a}) \left[ C - S_{11}(v_i) \right] - a C_{11} + (1 - q) u_i''(v_i) $$

$$ = q \left\{ u_z^2 S_{11} \left( 1 - \frac{dv^z_i}{dv_i} \right) - u_z^w S_{11} \frac{dv^z_i}{dv_i} \right\} L $$

$$ + \left( \frac{dv^z_i}{dv_i} \right)^2 u_i''(v_i^z) + \hat{a} \left( 1 - \frac{dv^z_i}{dv_i} \right)^2 S_{11} $$

$$ + \frac{a - \hat{a}}{2} \left[ S_{11} - S_{11}(v_i) \right] - \frac{a - \hat{a}}{2} \frac{dv^z_i}{dv_i} S_{11} $$

$$ - C_{11} [a - q(a - \hat{a})] + (1 - q) u_i''(v_i). \quad (A26) $$

I continue to assume that $S_{11} > 0$ and $u_z'^2 < 0$. Equation (A18) has only one positive term $-q((a - \hat{a})/(2)(dv^z_i/dv_i) S_{11}$, I assume that this term is small, so the second-order condition is satisfied.

To see how the condition changes for expectation damages note that, from Equation (A19),

$$ \frac{d^2 D_E}{dv_i^2} = C''(v_i) - S''(v_i) - \frac{q}{2} \left[ S''(v_i - v_i^z) \left( 1 - \frac{dv^z_i}{dv_i} \right)^2 - S''(v_i) \right]. \quad (A27) $$
Thus the second-order condition differs from that for reliance damages by the following terms:

\[-q/2 \left[ S''(v_1 - v^*_2) \left( 1 - \frac{dv^*_2}{dv_1} \right)^2 - S''(v_1) \right]. \tag{A28}\]

This expression will be negative so long as \(dv^*_2/dv_1\) is not small.

References


