DO SIDE PAYMENTS HELP? COLLECTIVE DECISIONS AND STRATEGIC DELEGATION

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Abstract
I investigate when side payments facilitate cooperation in a context with strategic delegation. On the one hand, allowing side payments may be necessary when one party's participation constraint otherwise would be violated. On the other, with side payments each principal appoints a delegate that values the project less, because this increases her bargaining power. Reluctant agents, in turn, implement too few projects. I show that side payments are bad if the heterogeneity is small while the uncertainty and the typical value of the project are large. With a larger number of parties there may be a stalemate without side payments, but delegation becomes more strategic as well, and cooperation decreases in either case. (JEL: C78, D78, F53, H77)

1. Introduction

Do side payments help? Collective decisions are hard to reach when any party can veto the project, as soon as it is not beneficial to that party. With side payments, however, the winners of a collective project can compensate the losers, such that they all benefit by implementing it. In fact, it follows from Coase's Theorem (1960) that negotiations are efficient in the absence of transaction costs. But in politics, and in many other organizations, it is not the principal (she) herself that negotiates the decision, but her representative or agent (he). A principal may thus be tempted to appoint an agent that is more negative towards the project, because he then has to be compensated by the other agents. When all principals delegate strategically in this way, the agents end up rejecting projects that would have benefited their principals. For this reason, introducing side payments can make cooperation less efficient.

This article investigates this trade-off in a very simple model. In the first stage, the principals simultaneously choose the identities of their agents. Thereafter, the agents get together to negotiate whether the projects should be implemented and, if feasible, a set of side transfers between them. Whether side payments are feasible

Acknowledgments: Thanks to the audiences at the University of Chicago, Toulouse School of Economics, the University of Warwick, London School of Economics, and the EEA meeting, particularly Bauke Visser.

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Journal of the European Economic Association April–May 2008 6(2–3):468–477

or not, the project is in equilibrium rejected too often compared to the social optimum. The reason is, for the case without side payments, that the winners are unable to compensate the losers, no matter how small their losses are. For the case with side payments, the reason is that each principal delegates to a reluctant agent to gain bargaining power, and reluctant agents do not implement all good projects. Side payments increase cooperation if and only if the net value of the project is likely to be large, the uncertainty is large, and the heterogeneity is small. If the number of parties increases it may be more likely that at least one agent needs compensation, but the principals appoint less enthusiastic agents as well. It is thus unclear whether side payments are more desirable for large clubs, since collective action is less likely either way.

The question of whether side payments should be used is relevant in many contexts. In markets, the question is similar to whether one should deviate from a benchmark (focal or pre-agreed) price. In domestic politics, transfers between districts can be facilitated by tax rates that differ across districts, or by letting the districts contribute unequally to regional public goods. For international negotiations, side payments could be facilitated by linking one type of agreement with another. Scholars have been puzzled by how seldom such transfers actually take place: tax rates are typically uniform across districts, and environmental agreements are seldom linked to trade, for example.

In many contexts, the feasibility of side payments depends on the institutional details. In the European Council, consisting of the heads of states and prime ministers, side transfers are possible because the negotiators have discretion over a large set of policies. The Council of Ministers, on the other hand, consists of specialized ministers who have less discretion over other policies: side transfers may thus be difficult. The optimal allocation of control between these two chambers may therefore hinge on whether side payments are good or bad, that is, on the conditions derived below.

Side payments are, as noticed, typically presumed to be good for efficiency.[1] **Fn 1** This article emphasizes a cost associated with side transfers, and explains when it may be beneficial to leave transfers out of the negotiations. Because side payments can be interpreted as issue linkages, the article contributes to the literature[2] **Fn 2** on whether such linkages are good. Interpreting the side payments as policy differentiation, the article explains why uniform policies often should exist.[3] In a **Fn 3**

1. For example, Nugent (2003, p. 357) observes that "linking issues together in 'package deals' can open the door to agreements by ensuring that there are prizes for everybody," and Cesar and de Zeeuw (1996, p. 158) state that "side payments are needed to reach the best result."

2. See, for example, Inderst (2000).

3. The fiscal federalism literature (see, e.g., Oates 1999) typically assumes that centralization implies uniformity, although such harmonization is considered to be a drawback: Alesina, Angeloni, and Etro (2005) criticize such harmonization and Hoel (1992) shows how it can reduce participation in environmental agreements.

related paper, Harstad (2007a), I argue that side payments may increase delay in bargaining when there is private information and this cost can outweigh the "gains from trade" that side payments sometimes facilitate. The model herein is different in three respects: First, there is no private information. Strategic delegation plays a similar role, however, because a principal can credibly delegate to a reluctant agent instead of signaling reluctance by delay, as when there is private information. Second, the number of parties is arbitrary. Third, side payments may be necessary to overcome the parties' participation constraints.[4]

That principals may enhance their bargaining power by strategic delegation is well-known in the bargaining literature. Already Schelling (1956) discussed such delegation, and this has been formalized by Jones (1989) and Segendorff (1998) in two-player games.[5] The present model of delegation draws on Harstad (2007b), where I study how delegation is affected by the majority requirement as well as the side payments. In this article, consensus is required and the model is therefore simpler.

2. The Model

There are n principals, $N = \{1, \ldots, n\}$, and one possible collective project. If undertaken, its value to principal $i \in N$ is $v_i - \theta$, where the common shock θ is uniformly distributed with the mean c and range 2σ:

$$\theta \sim U[c - \sigma, c + \sigma].$$

Assume that all $v_i \in (c - \sigma, c + \sigma)$, such that the project may or may not be beneficial. The v_i are common knowledge and, because they differ, it may be necessary with some transfers between the parties. Letting $s_i \in \mathbb{R}$ be the transfer to party i, the principal's utility from the policy is

$$u_i = v_i - \theta + s_i, \quad i \in N.$$

These transfers can be interpreted as a reallocation of the costs associated with the project. A uniform distribution of costs implies zero side transfers. For any distribution, the transfers must sum to zero:

$$s \equiv \sum_{i \in N} \frac{s_i}{n} = 0.$$

Variables without subscripts denote the average.

4. In Harstad (2007a), the participation constraints never bind, but policy differentiation can be beneficial because the value of public good provision differs across districts.

5. For delegation in regional negotiations, see, for example, Besley and Coate (2003).

In the first stage, let principal $i \in N$ be able to strategically delegate to some agent that has a $d_i \in \mathbb{R}$ higher (or $-d_i$ lower) value of the project, relative to his principal. Delegate i's payoff, if the project is undertaken, is common knowledge and given by $u_i + d_i$. Thus, the side payment to party i benefits both the principal and her agent. This is reasonable in political contexts, for example, where the agent is a citizen of the district he represents and a larger transfer benefits the entire district.[6] **Fn 6**

In the second stage, the common shock θ is realized and observed by everyone. Finally, the agents negotiate whether to undertake the project and the transfers between them. All agents must agree to the policy, and I let the outcome be characterized by the Nash bargaining solution. If the agents do not agree, everyone receives a utility of zero.

3. Cooperation, Side Payments, and Delegation

3.1. Collective Action without Side Payments

Suppose that side transfers are not feasible. Then, $s_i = 0$ for all $i \in N$, and the bargaining game becomes very simple. The project is undertaken if and only if all agents benefit from it. This requires that $\theta \in [c - \sigma, \theta_0]$, where $\theta_0 \equiv \min_{i \in N} \{v_i + d_i\}$.

The principals anticipate this at the delegation stage and principal i's problem is thus

$$\max_{d_i} \int_{c-\sigma}^{\theta_0} (v_i - \theta) \frac{d\theta}{2\sigma}.$$

The solution has

$$\frac{\partial \theta_0}{\partial d_i} \left(v_i - \min_{i \in N} \{v_i + d_i\} \right) = 0,$$

and therefore $d_i = 0$. Clearly, there is no benefit of strategic delegation. If i's agent should be pivotal, any agent with bias $d_i > 0$ ($d_i < 0$) would accept (respectively, reject) projects that would hurt (benefit) his principal. There is no strategic value of delegation, and principal i is better off being represented by an agent with the same preference as herself. That is, delegation is "sincere."

PROPOSITION 1. *Without side payments, $d_i = 0$ for all $i \in N$, and the project is undertaken if $\theta \leq \theta_0 = \underline{v}$, where $\underline{v} \equiv \min_{i \in N} v_i$.*

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6. I do not allow for action- or outcome-contingent transfers from the principal to her agent. If that were possible, inefficiency may nevertheless arise (Prat and Rustichini 2003; Jackson and Wilkie 2005), although unobservable contracts could make delegation ineffective (Katz 1991; Fershtman and Kalai 1997; Kockesen and Ok 2004).

Unfortunately, the project is undertaken too seldom. No matter how large is the average value $v \equiv \sum_i v_i/n$, the collective project will not be undertaken if just one v_i is less than θ.

3.2. Side Payments and Strategic Delegation

If side payments are available, the agents will negotiate the amount of transfers as well as whether to do the project. They can thus solve the stalemate just mentioned, but there may also be transfers between agents that all benefit from the project. Using the Nash bargaining solution, the agents end up with identical utility levels compared to their payoffs in the status quo:[7]

Fn 7

$$v_i + d_i + s_i - \theta = v + d - \theta,$$

and therefore

$$s_i = v + d - (v_i + d_i).$$

With these transfers, all the agents prefer to undertake the project if and only if $v + d - \theta \geq 0$, or equivalently

$$\theta \leq \theta_s \equiv v + d. \tag{1}$$

If this condition holds, agent i approves the project even if $v_i + d_i$ is small, because the side payment is then accordingly higher. Intuitively, a reluctant agent has large bargaining power and is able to extract transfers from the other agents. Similarly, a representative with a very large value of the project is forced, in equilibrium, to compensate those who benefit less. Anticipating this at the delegation stage, principal i realizes that she will pay less, or get paid more, by appointing a reluctant agent, such that $d_i < 0$. In equilibrium, therefore, d_i is going to be negative.

PROPOSITION 2. *With side payments, each principal delegates according to*

$$d_i = -(1 - 1/n)(v - c + \sigma) < 0 \quad \forall i \in N, \tag{2}$$

and the project is undertaken if and only if $\theta \leq \theta_s$*, where*

$$\theta_s = v/n + (1 - 1/n)(c - \sigma) < v. \tag{3}$$

7. From the Nash bargaining solution (if the project is implemented), which solves

$$\max \prod_{i=1}^{n} (v_i + d_i + s_i - \theta) \quad \text{subj. to: } \sum_{i=1}^{n} s_i = 0,$$

we have that $s_i = (v + d) - (v_i + d_i)$.

Proof. Principal i's problem becomes

$$\max_{d_i} \int_{c-\sigma}^{\theta_s} (v_i + s_i - \theta)\frac{d\theta}{2\sigma} = \max_{d_i} \int_{c-\sigma}^{\theta_s} (v + d - d_i - \theta)\frac{d\theta}{2\sigma},$$

which implies

$$\int_{c-\sigma}^{\theta_s} (1/n - 1)d\theta - d_i/n = (1/n - 1)(v + d - c + \sigma) - d_i/n = 0,$$

and therefore

$$d_i = d = -(1 - 1/n)(v - c + \sigma).$$

Substituting into expression (1) gives equation (3). □

In order to receive transfers from the other, each principal delegates to a reluctant agent. Because reluctant agents do not value the project as much as their principals, the project is too seldom implemented. This is exactly the drawback of appointing a reluctant agent: if $\theta \in (v + d, v + d - d_i/n)$, the agents reject the project and principal i receives zero, even though she would have received a positive utility, $v + \sum_{j \neq i} d_j/n - \theta$, by delegating sincerely. However, if θ is very uncertain, such that σ is large, then θ is unlikely to fall exactly in this interval. Moreover, if n is large, i's agent is in any case unlikely to be pivotal (making this interval smaller). And, if v is large and c is small, then most likely the project will be implemented even by the reluctant delegates. Consequently, i delegates to a very reluctant agent (by reducing d_i) if n, σ, and v are large and c is small. Notice that all delegates have the same bias relative to their principals: $d_i = d \forall i \in N$, d_i depends on v but not v_i.

3.3. Do Side Payments Help?

Whether side payments are available or not, the project is too seldom implemented. Because this is the only inefficiency in the model, side payments are good if projects are more often accepted if side payments are allowed than if they are not. This requires $\theta_s > \theta_0$, which immediately gives the following result.

PROPOSITION 3. *Side payments are good if and only if*

$$v - \underline{v} > (v - c + \sigma)(1 - 1/n). \tag{4}$$

On the one hand, side payments are good because they allow the winners to compensate the losers. This is likely to be necessary if the heterogeneity in values, $v - \underline{v}$, is large. On the other hand, side payments induce the principals to appoint agents that are negative towards the project. Strategic delegation is particularly severe if σ and v are large, and c is small. In these circumstances, side payments do more harm than good, exactly as Proposition 3 states.

Do side payments become more or less beneficial when n increases? The model predicts the latter, because d and θ_s decrease in n: the larger is the number of parties, the less likely it is that i's agent is pivotal, and the lower is the equilibrium d_i. Thus, if side payments are feasible, good projects are less likely to be approved when n is large, because the principals then delegate to more reluctant agents. This is the reason for why n appears in equation (4), suggesting that side payments are less attractive when the number of parties is large.

This result is in sharp contrast to the intuition that side payments should be *more* necessary when n is large, because the project is rejected as soon there is one single loser. To capture this intuition, $\underline{v}$ should decrease in n. The larger the number of parties, the smaller the minimum value is likely to be. In other words, the heterogeneity $v - \underline{v}$ should increase in n.

Exactly how $\underline{v}$ decreases in n is not obvious. If the new members of N are quite similar to the existing members, $v - \underline{v}$ may not increase much in n, making equation (4) less likely to hold as n grows. But if the "new" members of N are likely to be very different from the old members, $v - \underline{v}$ may increase greatly when n grows. This makes expression (4) more likely to hold and side payments are then good. This is the case, for example, if the heterogeneity $v - \underline{v}$ is proportional to n.

The average value V may also be a function of n. If the new members of N are likely to have high values of the project, v increases in n and side payments become bad. If, instead, the new members have low values of the project, side payments become beneficial when n increases.

COROLLARY 1. *When n increases, side payments become more beneficial if the new members' v_i are different from or smaller than those of the existing members. Conversely, side payments become less beneficial if the new members' v_i are similar to or larger than those of the existing members.*

4. An Example with Stochastic Heterogeneity

Taking the v_i as given simplifies the analysis. The desirability of transfers is then a function of the cost-thresholds (θ_0 and θ_s) only, and it is not necessary to calculate the expected utilities.

This section shows how the results extend to a model where individual values are random. Because we already have an aggregate shock in the model, simply let another shock ε, realized at the same time, determine the individual values without affecting v. For a given v, the individual values are irrelevant for the case of side payments and, for the case without, only the minimal v_i matters. Therefore, suppose that $\underline{v}$ is affected by the shock ε in a very simple way:

$$\underline{v} = v - \varepsilon, \quad \text{where } \varepsilon \sim U(0, \bar{\varepsilon}). \tag{5}$$

For $n = 2$, ε can be interpreted as $\varepsilon = |\varepsilon|$, where $\varepsilon \sim U(-\bar{\varepsilon}, \bar{\varepsilon})$ and ε simply increases 1's value while simultaneously reducing 2's value by the same amount, thus keeping v fixed: If $v_1 = v + \varepsilon$ and $v_2 = v - \varepsilon$, $\min\{v_1, v_2\} = v - |\varepsilon|$.

The larger is $\bar{\varepsilon}$, the larger is the potential heterogeneity. Intuitively, side payments should be beneficial if $\bar{\varepsilon}$ is large, whereas the comparative static with respect to the other parameters may be as before. This intuition is correct, and the previous result is unchanged if we just replace $v - \underline{v}$ by $\bar{\varepsilon}/\sqrt{3}$.

PROPOSITION 4. *Assuming definition (5), side payments are good if and only if*

$$\bar{\varepsilon}/\sqrt{3} > (v - c + \sigma)(1 - 1/n). \tag{6}$$

Proof. If there are no side payments, the average utility can be calculated to be

$$u_0 = \int_0^{\bar{\varepsilon}} \int_{c-\sigma}^{v-\varepsilon} (v - \theta) \frac{d\theta}{2\sigma} \frac{d\varepsilon}{\bar{\varepsilon}} = [(v - c + \sigma)^2 - \bar{\varepsilon}^2/3]/4\sigma.$$

With side payments, on the other hand, ε does not affect θ_s, and ε's distribution does not affect d. The average utility is then is independent of ε and $\bar{\varepsilon}$:

$$u_s = \int_{c-\sigma}^{\theta_s} (v - \theta) \frac{d\theta}{2\sigma} = \frac{(v - c + \sigma)^2 (2n - 1)}{4\sigma n}.$$

Comparing u_0 and u_s concludes the proof. □

5. Conclusion

Do side payments make collective action more likely? The common presumption is "yes": by allowing transfers, winners can compensate the losers and any agreement that increases total utility can be implemented as a Pareto improvement. However, this article shows that, with side payments on the agenda, principals delegate to more reluctant agents to gain bargaining power. More reluctant agents are, in turn, less likely to approve good collective projects. Side payments make collective action less likely if the value of cooperation is quite uncertain but likely to be large, and the heterogeneity is small. If the number of parties increases, cooperation is more likely to fail if transfers are not feasible, but if they are feasible, principals delegate to more reluctant agents. Therefore, it is not clear whether side payments become more or less beneficial when the number of parties grows.

The model is directly applicable to multiple projects: It does not need to be binary. By letting the random cost θ measure a deterministic cost of one particular project, cooperation takes place for the set of projects where the cost θ is less than some threshold. With this interpretation, collective action always takes place, but for a range of projects that is smaller than what is optimal. The range may increase or decrease by adding side payments, depending on the conditions derived above.

Whether side payments—or flexible prices—should be used is obviously relevant in economics. Also in politics, these questions are very important. Side payments may be facilitated by linking different political issues, or by allocating authority to the heads of governments, instead of more specialized ministers. Typically, economists advocate such linkages and transfers, because then Coasian bargaining may lead to efficiency. It is thus puzzling why side transfers, particularly explicit payments, often are absent from international agreements. This article contributes to explaining this puzzle, and it points to circumstances where, and reasons for why, side payments may be bad.

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