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In the Shadow of Coase

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Abstract

We explore how three parties bargain over a public good created by development on only one party's property. With strong property rights, parties secure equal payment. With weak rights, parties reimburse costs and divide surplus so the developer is indifferent.

Keywords: public good, bargaining, experiment

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1. Introduction

In Canada, Aboriginals may not reap benefits from development on historical lands. The Supreme Court of Canada (SCC) repeatedly ruled that the government – the Crown – has an honorable duty to consult and accommodate Aboriginals when development projects may affect their rights on historical lands. How much compensation, if any, Aboriginals receive depends on their legal claim to the lands.[1] With claims of pre-European occupation over a territory, two cases arise: (1) weak property rights—no Aboriginal title: with unproven claims, the Crown must consult and accommodate, but the "Crown is not under a duty to reach an agreement" over development or benefit sharing-rules;[2] and (2) strong property rights—Aboriginal title: when Aboriginals' claims are legally recognized, the granted *Aboriginal title* is as close as Aboriginal property rights get to *fee simple ownership* – it gives Aboriginals the right to decide how the land will be used and the right to the economic benefits of the land.[3]

Herein we design an experiment to explore the bargaining behavior in these two property rights cases. We explore how three parties (A, B, C) bargain over a public good created by private development of a resource found only on A's property (e.g., Aboriginal lands with timber concessions, hydropower development). Development is too capital-intensive for A to develop alone. The three owners form a governing body to decide whether to develop and how to distribute the associated benefits. We examine how they divide development benefits when A (Aboriginals) have weak or strong property rights given that only A bears private costs from

[1] See (Clyde River (Hamlet) *v.* Petroleum Geo-Services Inc., 2017 SCC 40, Chippewas of the Thames First Nation *v.* Enbridge Pipelines Inc., 2017 SCC 41).
[2] See Haida Nation *v.* British Columbia (Minister of Forests), par.[10].
[3] See Tsilhqot'in Nation *v.* British Columbia, 2014 SCC 44, par.[73].

development (e.g. lost economic value from historical land). With weak property rights, Owner A alone cannot refuse development. Benefit shares follow from consultations and negotiations with B and C. Strong property rights give A the power to *(i)* veto unacceptable developments and benefit shares and *(ii)* enforce his outside option, status quo. We use weak/strong property rights and majority-rule/veto-rule interchangeably.

Using a three-person Coasean bargaining experiment (Cherry and Shogren, 2008), we find with strong property rights, all owners get an equal net share. With weak rights we find B and C reimburse A's costs and distribute the remaining surplus such that A is indifferent between developing or not. Our results suggest that only strong rights ensure Aboriginals get their fair net share of benefits from development on historical lands. Without strong rights, significant inequity is avoided only if the other owners have sufficiently large social preferences (see e.g., Rubinstein, 1982; Rand et al., 2013).

2. Equilibrium Concepts

We first define our benchmark equilibria. All outcomes that develop the resource are Nash equilibria (Haller, 1986). We focus on focal point equilibria in which coalitions of owners receive the same gross or net benefits, i.e., "fair" outcomes for players with social preferences. The three focal points are: (1) A, B, and C receive the same net payout (including private cost), (2) A, B, and C receive the same payout from developing the resource (excluding private costs), and (3) A's private costs are just compensated, with the rest equally allocated between B and C—a coalition between B and C with social preferences in which they leave A in an "on-net no harm" position. Outcomes excluding one owner from the coalition are privately optimal for the other members but signal that social preferences have less influence on resource allocation.

3. Experimental Design

The experiment begins with participants being assigned a random number (1-9), signing a consent form, and a monitor reading the instructions aloud and answering clarifying questions. Participants are then randomly assigned to a three-person group and sit in a circle with a monitor. Within each group, participants blindly select one of three cards determining their positions — Owner A, B, or C— and the first round begins.

In each round, each participant receives a 1000 "token" endowment, which are exchanged for dollars at the end at the rate 400 tokens per dollar. In each group, a monitor randomly selects one participant to make an initial offer using an offer form that states (i) whether to develop the resource and (ii) how the 3000-token profit from development is allocated among A, B, and C. If the resource is developed, A loses 1500 tokens (e.g., lost economic value). Participants vote on an offer by simultaneously holding up a card reflecting their choice. If the offer is not accepted, the offer form is passed counter-clockwise and the next player makes an offer. This continues until an offer is accepted or negotiation time expires (5 minutes). Negotiation costs, hereafter transaction costs, are deducted from this endowment at a rate of one token per second. If no offer is accepted, negotiations cease, the resource is not developed, and each endowment is reduced by 300 tokens. Once a round ends, participants go to another table and repeat the simulation with two new participants.

We represent property right strength with the majority-rule treatment (weak)—an offer is accepted if a simple majority votes in favor, and the veto-rule treatment (strong)—an offer is accepted if a majority *including the resource owner* (A) votes in favor. The participant making the offer must always vote in favor. Each session consisted of six rounds; three of each treatment. After the six rounds, participants answer a questionnaire on their understanding of the

experiment and demographics, and they exchange tokens for take-home pay. We control for order effects by using the simple majority vote in the first 3 rounds and the landowner-veto in the next 3 rounds for four sessions. The order is reversed in three sessions.

Our data include every offer, who made the offer (A, B, or C), round number, negotiation time, how the 3000-token development benefits was allocated, each player's position, table number and data from the questionnaire. For each negotiation in each round, we compute a modified Gini coefficient allowing for negative net payments (Chen et al., 1982). A larger Gini implies a more uneven distribution of net payouts. We obtained 189 observations in each treatment; 378 observations in total (375 contained the data needed for our analysis).

4. Results

We find average inequality and payouts are statistically different between the treatments (see Table 1); transaction costs do not statistically differ between treatments (Fréchette et al. 2003). Two key results emerge. First, with strong property rights, all owners receive an equal net payout, consistent with Focal Point #1.[4] B and C compensate A for more than lost value from development because she would otherwise reject development offers.

We conduct a regression analysis to confirm our unconditional results (see Table 2). A positive coefficient on the treatment dummy in column (1) means the majority-rule leads to a larger Gini coefficient (more inequality). In columns (2) and (3), we subset the data to examine outcomes for A and the sum of B and C. A positive coefficient means the majority-vote leads to a larger gross payout to that owner. Our results are robust to various controls.[5] When A has a

[4] We do not reject that mean net payouts are jointly equal (p-value=0.141).

[5] Controls include: transaction costs, number of offers in a round, round dummies, whether participants have met in a prior round, and others. We find evidence of learning leading to less equitable outcomes across rounds. An interaction term for when Owner A started the bidding was negative and significant (i.e., outcomes are more equitable), but this does not affect our main results and is excluded in Table 2.

veto, the mean outcome is more equitable: A exercises her right to compensation for development costs. Columns (2) and (3) are consistent with this hypothesis.

Second, with weak property rights, B and C compensate A for lost value from development, and they distribute the remaining surplus equally such that A is indifferent on developing. We cannot reject (p-value=0.717) that these payouts are consistent with Focal Point #3, leaving A in an "on-net no harm" position. We hypothesize that social preferences motivate B and C's compensation of A for her costs incurred by development.

5. Concluding remarks

Our Coasean bargaining results are consistent with the historical development of resources on Aboriginal lands in Canada. While recent SCC rulings clarified the Crown's responsibilities, only an Aboriginal title ensures Aboriginals have an outside option that guarantees their bargaining power. Without such leverage, compensation depends on the social preferences of those promoting development. Without the ability to stop development, indigenous users are not compensated for the shadow value of the resource. Even with compensation for lost value, a lack of compensation for the loss of the ability to say "no" can explain Aboriginal dissatisfaction with resource development on historical lands.

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Table 1 Summary statistics (with development)

	(1)	(2)	(3)	(4)	(5)
Treatment	Gini Coefficient	Owner A Gross Payout	Owner B Gross Payout	Owner C Gross Payout	Transaction Costs
Veto-Rule	0.041	1969.39	557.92	472.69	34.97
N=61	(0.067)	(268.10)	(227.17)	(222.53)	(23.47)
Majority-Rule	0.079	1479.84	766.13	754.03	29.45
N=62	(0.101)	(770.32)	(373.81)	(416.89)	(17.99)
Difference	-.0378**	489.55***	-208.21***	-281.34***	5.52
	(0.016)	(104.35)	(55.89)	(60.40)	(3.76)

Standard deviation reported in parentheses, p-values represented by stars (*=0.1, **=0.05, ***=0.01).

Table 2. Regression results

	(1)		(2)		(3)	
Variable	Gini Coefficient		Gross Owner A Payout		Gross Owner B and C Payout	
Majority-Rule Treatment	0.026***	0.032***	-250.524**	-254.450*	101.452**	63.753
	(0.010)	(0.011)	(118.223)	(132.453)	(44.253)	(49.290)
Constant	0.048***	0.052***	1806.873***	1164.114***	572.754***	639.057***
	(0.007)	(0.022)	(83.596)	(260.739)	(31.292)	(94.365)
Started Bidding		-0.001		211.011		72.040
		(0.019)		(223.611)		(84.117)
Transactions Costs		0.001***		-4.765		2.043*
		(0.000)		(3.373)		(1.211)
Number of Offers		-0.022		403.009**		-164.526**
		(0.016)		(185.665)		(67.252)
Second Pairing with Table Member		-0.005		75.158		23.737
		(0.013)		(148.420)		(53.610)
Owner A		0.000				
		(0.010)				
Final to Bid		0.001		147.387		54.726
		(0.019)		(228.078)		(84.983)
Early Session		-0.001		85.263		-1.052
		(0.010)		(110.933)		(40.511)
Veto Treatment First		0.031***		-266.712**		208.532***
		(0.010)		(115.241)		(42.048)
Round 1		-0.061***		495.219**		-214.432***
		(0.017)		(196.874)		(72.465)
Round 2		-0.046***		626.721***		-236.187***
		(0.017)		(195.298)		(71.826)
Round 3		-0.037**		335.046*		-207.563***
		(0.016)		(189.585)		(68.429)
Round 4		-0.016		235.936		-39.923
		(0.017)		(200.783)		(71.454)
Round 5		-0.001		107.912		44.474
		(0.017)		(193.649)		(71.814)
Observations	375	375	126	125	252	250
R-squared	0.019	0.113	0.035	0.262	0.021	0.240
Adj. R-squared	0.017	0.079	0.027	0.176	0.017	0.198
F statistic	7.329	3.285	4.491	3.035	5.256	5.718

Standard errors reported in parentheses; p-values represented by stars (*=0.1, **=0.05, ***=0.01).