THE ELASTICITY OF FORCE: DETERMINANTS OF TERMS OF TRADE IN AMERICAN INDIAN TREATIES

by

Scott Alan Wood

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APPROVAL

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Scott Alan Wood

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10 August 1992
Date

Chairperson, Graduate Committee

Approved for the Major Department

8-26-92
Date

Head, Major Department

Approved for the College of Graduate Studies

9/4/92
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ABSTRACT

In the nineteenth century the United States Government acquired millions of acres of land from Indian tribes. In the early part of the century the government obtained land primarily through purchase. Later, however, land was taken by force.

This paper is a theoretical and empirical investigation into the role of force in causing the change in government Indian policy and the effect of force on the outcomes of negotiated treaties.

A theory of force in negotiated settlements is developed and tested in the context of American Indian treaties with the U.S. government. The conclusion is that the government used its superior military strength to reduce the prices paid for Indian land.

CHAPTER 1

INTRODUCTION

Indian-white relations in the American West during the 1800s provide an excellent context in which to analyze the role of force in determining outcomes of negotiated settlements. The 1800s were marked by intense conflict between whites who wanted lands and the Indians who lived on them. At times, peaceful treaty negotiations resolved these conflicts, at other times conflicts escalated into violent wars.

Conflict in bargaining over land arose out of disagreements about how the gains from trade should be distributed since both Indians and whites wanted a larger share. The process of treaty negotiation resolved these conflicts. But why did Indians finally agree to an offer made by the whites? Why did one party acquire a larger share of the gains? Superior negotiating strategies, imperfect information, and the threat of force are among the explanations of dispute resolution.

Economic analyses of Indian-white negotiations assume rational, maximizing actors. In the analyses force becomes one strategy for manipulating the distribution of the gains

from trade. The thesis is that the federal government systematically used the threat of force to reduce the prices paid for Indian lands in negotiated treaties. Tests of the theory employ data from nineteenth century Indian treaties negotiated on the western frontier.

Organization

The analysis begins in Chapter 2 with a discussion of the history of Indian-white relations and U.S. government Indian policy of the nineteenth century. The century is divided into three time periods, each distinguished by the nature of government Indian policy. The chapter focuses on the role of relative military strength in shaping those policies and its effects on prices paid to Indians for land.

Chapter 3 presents a theoretical framework to explain the role of force in negotiated agreements. The theory yields refutable hypotheses which are tested using econometric models employing data from Indian treaties and other relevant sources. In chapter 4, the models and data are explained and the test results presented. Chapter 5 concludes the analysis with a brief summary and general implications.

CHAPTER 2

INDIAN-WHITE RELATIONS IN THE 1800S

The history of Indian-white relations in the nineteenth century American West is fraught with controversy. Questions ranging from the number of whites and Indians killed to the motivations and methods of westward expansion remain largely unresolved. Throughout the 1800s, U.S. government policy played a prominent role in shaping Indian-white relations. The most important issue concerned land; to whom did it belong and how did the government acquire legal title? The early part of the century witnessed few battles, as land changed hands primarily through peacefully negotiated treaties. But, in the latter part of the century land was acquired almost exclusively through the use of force. Accordingly, Indian-white relations deteriorated drastically over time.

Such a severe shift in government Indian policy begs the question: Why? Why did Secretary of War Henry Knox insist in 1789 that, "The Indians being the prior occupants, possess the right of the soil. It cannot be taken from them unless by

their free consent?"[1] While in 1875, the government announced to the Sioux that all Indians of the tribe "who were not at the agencies by January 31, 1876, would be hunted down by the army and brought in by military force."[2]

At the heart of the issue is the comparative advantage in the use of force.[3] Throughout the eighteenth century and into the nineteenth century this advantage was with the Indians. It is not surprising, therefore, that negotiation with Indians was the expressed policy of the new government. In October of 1786, a Congressional committee recommended an increase in the number of troops on the frontier to protect settlers and to assist in settling new lands that the government had relied on for retirement of Revolutionary War debt. During this time there were 500 government troops in the Old Northwest where Indians had fiercely resisted American expansion. Secretary Knox warned that war with the Indians would "most exceedingly distress the United States." He therefore recommended that these troops should be used to maintain peaceful relations between whites and Indians. Knox estimated that in order to

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[1]Reginald Horsman, Expansion and American Indian Policy, (East Lansing, MI: Michigan State University Press, 1967), 55.

[2]Francis Paul Prucha, The Great Father: The United States Government and the American Indians (Lincoln, NE: University of Nebraska Press, 1986), 112.

[3]Throughout the thesis, comparative advantage in the use of force is defined as the ability to acquire (or defend) a given amount of wealth with fewer inputs than the opposing group.

maintain peace, 1500 troops were required but "the depressed state of the finances will not admit the measure." Congress then acquiesced, accepting instructions given by Knox stating that "most important considerations render it necessary that the United States should be at peace with the Indians." Even so, the Northwest Ordinance expressed the determination of the United States to settle the Northwest Territory. Knox reassured Congress that peaceful settlement was still possible, insisting that "a treaty and purchase money for land was the most prudent measure and in no degree dishonorable to the nation."[4]

The Indians were more adept at using and threatening force for many reasons. The Six Nations of the Iroquois League had been a political and military force in the Northeast for hundreds of years. The Creek Confederacy was an equally strong entity in the South. Early negotiations with these groups laid the foundations of the treaty system. Because the U.S. military was relatively weak, the official policy as expressed by Secretary Knox was to peacefully negotiate with the Indians. This policy was continually frustrated by white settlers who encroached on Indian lands creating unwanted conflict between the tribes and the federal government.[5] At times, the military was employed to keep

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[4]Quoted in Horsman, 32-38.

[5]For more on this agency issue, see Jennifer Roback, "Exchange, Sovereignty, and Indian-Anglo Relations," in Property Rights and Indian Economies (Lanham, MD: Rowman and

white settlers off Indian land.

Over time, however, military advantages increasingly shifted to the government and white settlers. The collapse of the two main Indian confederacies led to fighting amongst the various tribes and cleared the way for the government to exert increased influence in Indian-white relations.

Relations in the 1800s

The chronology of U.S. Indian policy is examined in three distinct time periods. The first period, between 1800 and 1846, was primarily a time of inducing the eastern tribes to exchange their lands for western lands beyond the Indian frontier. After 1846, because new territories had been acquired in the West, the removal policy was no longer workable as a permanent Indian frontier no longer existed. The new policy sought to move the tribes to Indian territory in the North and the South to allow a passageway for whites to the West. It was during this second period, from 1846 to 1880, that most of the fighting and treaty making took place. The third period, after 1880, marks the end of virtually all military resistance by the Indians as the last non-reservation tribes were confined and subjected to government control.

Littlefield Publishers, 1992). Terry L. Anderson, Editor.

Removal Policy 1800-1846

During the first period, relations between the races were rather peaceful. Robert Utley describes conditions prior to the Mexican War; "Neither race posed much of a threat to the other, and on the whole they got along fairly well."[6] The policy of removal was most successful during the administration of President Monroe. However, the idea originated with Thomas Jefferson in 1803 when the Louisiana Purchase made such a policy workable.[7] Monroe and Secretary of War, John C. Calhoun had hoped that moving the Indians beyond the reach of white settlers would end the problem once and for all. Monroe was opposed to forced removal stating that it would be "revolting to humanity and utterly unjustifiable."[8] Instead, he favored convincing the tribes that they would be better off on the western lands where they could prevent white intrusion and work toward civilization.

The removal policy continued and intensified under president Andrew Jackson, who saw two possibilities for the eastern tribes. They could either move to western lands or become subject to the laws of the states in which they resided. A removal bill was passed by the Senate and the House and signed by Jackson on May 28, 1830. The act

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[6]Robert M. Utley, Frontiersmen in Blue: The United States Army and the Indian, 1848-1865. (Lincoln: University of Nebraska Press, 1967), 59.

[7]Prucha, The Great Father, 65.

[8]Ibid., 67.

authorized the United States to begin negotiations with the tribes as to the details of removal. Between 1830 and 1835, removal treaties were negotiated with each of the Five Civilized Tribes, and by 1840 sixty thousand Indians were settled in the Indian territory, now the state of Oklahoma.[9]

The removal process was not completely peaceful, however. War with the Seminoles in Florida and the Black Hawk War ignited by removal efforts in the Old Northwest presented only temporary setbacks for the U.S. But outbreaks of war were relatively rare because the majority of Indians, or at least a majority of those with decision making power, came to view the exchange of lands as the best alternative given the continually increasing white pressure on Indian lands in the East. It may seem paradoxical that Indians continued to cede land even though they held some military advantages. However, they must have expected that what they received in return would be more valuable than the land they gave up. While the new lands were of a lower quality and the journey long and arduous, the promise of an end to conflict with whites along with additional annuities and non-cash payments, made the exchanges worthwile to the tribes. Prolonged and intense fighting with the government would not have made economic sense for the Indians since their land in the East was increasingly scarce, while western lands were abundant.

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[9]Ibid., 78.

Reservation Policy 1846-1880

The removal of the eastern tribes continued more or less peaceably throughout the 1830s and early 1840s. However, Indian-white relations changed fundamentally in the wake of the Mexican War. Texas was added to the nation in 1845, as was Oregon in 1846 and the Mexican Cession in 1848 which included California and New Mexico.

> The Mexican War had scarcely opened in 1846 before government officials began to recognize its implications for Indian policy. Consideration of measures focused on three major objectives that acquisition of the new territories imposed on federal Indian policy. First, military protection had to be provided to citizens threatened by Indians. Second, Indian title to lands coveted, needed, or already possessed by whites had to be formally "extinguished." Third, now that removal beyond a Permanent Indian Frontier was no longer possible, some other humane disposition of the Indians had to be worked out.[10]

The government not only had to contend with increased westward traffic but with many new tribes which were, as Prucha puts it, "warlike and untamed and uninterested in transforming themselves into English-speaking farmers."[11] The new policy which developed in response to these problems was one which would define Indian-white relations for the rest of the century. Reservations were designed to "let the oncoming settlements flow on by, leaving behind islands of Indians in a sea of whites."[12] An additional goal of the

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[10]Robert M. Utley, The Indian Frontier of the American West 1846-1890 (Albuquerque: New Mexico Press, 1984), 39-40.

[11]Prucha, The Great Father, 126.

[12]Utley, Frontiersman in Blue, 76.

policy was to facilitate the eventual civilization of the tribes. Negotiation of treaties remained the method by which each of these objectives was to be achieved, and they were achieved with varying degrees of success.

Attempts in the 1850s to place Indians on reservations through the treaty process failed in large part because the government lacked the military strength to enforce the agreements. Thomas Fitzpatrick, guide to emigrants and the army in the West and primary negotiator in the Fort Laramie and Fort Atkinson treaties of 1851 and 1853, urged that no "big talks" should be held with the Plains Indians until they had been soundly thrashed by soldiers. Without such thrashings, they could not be induced to stay on reservations.[13] Sufficient military strength to persuade the Indians would soon be achieved but only as a by-product of the military buildup that accompanied the Civil War.

The Civil War military buildup is, arguably, the single most important event that caused the government to attain a comparative advantage in the use of force. Between 1850 and 1860 total army personnel ranged from 11,000 to 16,000 men climbing to 1 million in 1865. After the war total enlistment declined but remained at almost double the prewar levels, ranging from 27,000 in 1870 to 37,000 in 1890.

As the numbers changed, the nature of the army changed in ways that had a profound effect on Indian policy. Immediately

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[13]Utley, The Indian Frontier, 60, 63.

following the War (and to some extent during it), military action against the Plains Indians increased dramatically. Lincoln and most of the rest of the government were concerned primarily with the aftermath of war, but the generals who had turned their attentions west made U.S. Indian policy almost exclusively a military one. It would have taken no great foresight to predict this behavior by the generals for there was little else they could do. Congressman Fernando Wood (D-N.Y.) labeled officers as "idle vagabonds who are so well paid and do nothing." Fellow representative John A. Logan (R-Ill.) claimed that "many of our officers have very little else to do than wear their uniforms and attend receptions."[14]

Army officers viewed fighting Indians as the most expedient method of justifying their positions and securing promotions, both within the army and without. Colonel Chivington, the military commander in Colorado, best exemplified these motives. His aspirations for congressional office after Colorado was authorized to apply for statehood caused him, at least partially, to initiate the massacre at Sand Creek. He was praised by the people of Denver for his heroism, although news of the brutal attack repulsed many in the East. Chivington was not alone in his desire for war. Secretary of Interior Orville Browning complained in 1867 that "The War Department seems bent on general war and will

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[14]Quoted in Robert Wooster, The Military and United States Indian Policy, (New Haven: Yale University Press, 1988), 74.

probably force all the Indians into it."[15]

In the years following the Civil War, several bills were introduced in Congress to reduce the number of army personnel even further. Some members of Congress, such as Representative Wood demanded that the army be cut to prewar levels.[16] In 1874 the House Military Affairs Committee stated that there were "too many soldiers engaged in the ordinary duties connected with periods of profound peace" and that "there is a large number of troops stationed in the interior having no special duty to perform."[17]

The movement for a smaller army was halted in 1876 after Custer's disaster at Little Big Horn. The change in mood is evidenced by General William Sherman's advice to General Philip Sheridan in July 1876 that "Congress is now in session willing to give us all we want."[18] Congress subsequently supplied the generals with additional troops which reduced the costs of fighting relative to negotiation.

In addition to the bureaucratic incentives faced by the post-war army, technological innovations also caused the government to attain a comparative advantage in the use of force. The introduction of breech-loading and repeating

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[15]Utley, The Indian Frontier, 108.

[16]Wooster, 85.

[17]Quoted in Joseph C. Bernardo and Eugene H. Bacon, American Military Policy: Its Development Since 1775 (Harrisburg: Stackpole, 1961), 239.

[18]Wooster, 86.

rifles to replace the muzzle loaders of the Civil War gave the army a decisive, if only temporary advantage. Cannons, Gatling guns and Hotchkiss guns also impressed the Indians. One Apache told an officer after his group of warriors had been soundly defeated by soldiers using these big guns, "We would have done well enough if you had not fired wagons at us."[19] But the comparative advantage was not always and everywhere with the government. Often the Indians were better equipped, better prepared and more skilled than army troops.

One reason the Indians were at times better prepared than the army was due to informational advantages. As General Custer would no doubt attest, information was perhaps the most valuable commodity affecting relative military strengths. The Indian village at Little Bighorn on June 25, 1876 contained about three times as many warriors as Custer had expected. The Fetterman Massacre of 1866 was also a result of faulty information. A few Indian decoys lured about eighty troops from Fort Phil Kearney into an ambush by between fifteen hundred and two thousand warriors. Information about the nomadic tribes was extremely costly to acquire on the vast plains. More accurate information would have significantly reduced the occurrence of such lopsided battles.

In addition to poor information, the lack of adherence to treaty provisions by each side was a source of friction on the frontier. On the Indian side, chiefs signing treaties were

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[19]Quoted in Utley, The Indian Frontier, 67.

often unsure of what they had agreed to and usually lacked authority to compel others into compliance. As Utley points out, "Chiefs rarely represented their people as fully as white officials assumed."[20] Whites also failed to comply as settlers and frontiersmen trespassed on reservation lands. Government officials who were to administer the payment of annuities frequently took a cut for themselves.[21,22] These enforcement problems exacerbated the climate of distrust which plagued the treaty process throughout the century.

Indian Dependence 1880-1900

The final period of the century began in the early 1880s as western tribes moved to reservations. Defeated militarily, starving and demoralized, they put up little resistance and became almost wholly dependent on the government. Agreements reached were largely dictated to the tribes. The question of who held the comparative advantage in the use of force during this period is not in doubt. Payments to tribes were no longer exclusively for the purchase of land but also to maintain the tribes' existence.

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[20]Ibid., 44.

[21]Ibid., 78.

[22]Also see Roback, "Indian-Anglo Relations," 1992.

Treaties

Whatever form government policy took throughout the century, the tool used to define relations was the treaty. Every tribe, at some time and place, was involved in negotiations with the government. Each of these treaties set the terms by which Indians ceded land and how they were to be compensated. The compensation took both cash and non-cash forms with schoolhouses, cattle and food staples being popular payment methods. Treaties were used to accomplish two primary goals. The first was to acquire legal and actual title to Indian lands which was to be accomplished by simply paying the tribes. The second was to civilize the tribes through the methods of payment. For example, farm implements were provided to induce the Indians to become farmers.

Treaties with vastly different tribes nonetheless looked quite similar, as if constructed by formula. A typical treaty began with a paragraph expressing mutual desires for peace. Boundaries of the reservation were then defined while all lands outside these boundaries were ceded to the government. The payments to the tribes usually included annuities with yearly payments as well as payments "in kind." School houses, teachers, blacksmiths, physicians, clothing, cattle, and instructions in farming were typical methods of payment. Other articles might specify conditions under which lawful trespass might occur, or where and when Indians could hunt off reservation lands.

Total compensation for ceded lands varied widely from zero to 100 percent of fair market value.[23] It is precisely these variations that are to be explained by the theory which suggests that relative abilities to successfully apply force alter the terms of peaceful negotiation in predictable ways.

[23]Fair market value has been defined by the courts in twentieth century Indian claims cases. This figure will be discussed further in the econometrics chapter.

CHAPTER 3

THEORETICAL DEVELOPMENT

A fundamental tenet of economics is that voluntary trade is mutually beneficial. Each party agreeing to a trade is better off after the trade than before, otherwise, no agreement would be reached. Since voluntary trade allows each party to gain, or become wealthier, there is a strong incentive to seek out possible trades and trading partners. And it is in the interest of each party to the trade that an agreement be reached. When all the gains from trade are exhausted, the allocation of goods and services is efficient. The efficiency of trade has been a primary focus of classical economics.

The focus of the current study however, is on another aspect of trade: distribution. Though two individuals negotiating a trade have an interest in seeing that an agreement is reached, the interests of the two clash with respect to the terms of trade, or the **distribution** of the gains. For example, when a piece of land is to be sold, the seller would like to receive as much as possible, and the buyer would like to pay as little as possible without breaking off the agreement completely.

Trade, however, may not be the least costly means of acquiring goods. While one person may determine that the least costly way to obtain a new car is to trade job services for a salary and purchase the car from a dealer, another person may conclude that the car can be acquired at least cost by stealing it. In the first case, the ownership rights to the car are **exchanged** through a market; in the second, they are **transferred** outside the market. In either case, investments are made in reducing the cost of obtaining the car. One may invest in education and training, the other in burglary skills.

Of course there are countless ways of reducing the cost of acquiring goods. But one which, according to John Umbeck, underlies all allocative systems is force or the threat of force.

The Umbeck Model

The role of force in the formation and initial distribution of property rights has been examined by John Umbeck.[24] His model provides a beginning framework for analyzing how the ability to acquire and maintain resources through the threat or actual application of force affects the bargaining process. According to Umbeck, "all ownership rights are based on the abilities of individuals, or groups of

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[24]John Umbeck, "Might Makes Rights: A theory of the Formation and Initial Distribution of Property Rights, "Economic Inquiry (January 1981): 38-59.

individuals, to forcefully maintain exclusivity."[25] The conclusion is that any negotiated outcome must provide each individual with the same amount of wealth as he could have acquired through violence. If an agreement does not result in such a distribution, resources will be voluntarily or forcefully reallocated. The person who believes he could have acquired more wealth by using force than was obtained through the agreement will seek a reallocation of wealth. Reallocation will occur because the more forceful individual is willing to devote more resources to taking property rights than another is willing to devote to defending the rights.

The Umbeck analysis rests on four restrictive assumptions which limit more broad applications of the model. These are: 1) individuals have equal abilities in the use of violence; 2) each person knows precisely how much violence another is willing and able to use in any potential conflict; 3) the costs of entering into any contractual arrangement are prohibitive; and 4) individuals have no (or equal) previously acquired wealth.

Umbeck notes that, because of these assumptions, his paper provides "only a more general theory of competition as a constraint on the allocative process."[26] Since he assumes and observes no variance in the ability to use force, all distributions of land, in both the theory and the empirical

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[25]Ibid., 39.

[26]Ibid., 57.

test, were attributable only to differences in land values. "To test for the actual importance of force we would need to find a situation where this variance was relatively large. Then we could determine whether the most forceful individuals received more wealth than those who were relatively weak."[27]

The history of Indian-white relations provides this situation. The variance in the ability to use force was quite large between the two groups and changed dramatically over the course of the nineteenth century. In this context, it is expected that those with a comparative advantage in the use of force can acquire more wealth through forceful takings or can use threats of force to alter the terms of trade in their favor.

The development of the theory requires that the Umbeck assumptions be relaxed. Therefore, Indians and whites are not assumed to be equal in their abilities to use force. It is precisely these different abilities and their effect on the outcome of negotiated settlements that the theory tries to explain. Each side is uncertain about how much violence the other is willing to use in a potential conflict. This assumption makes the actual occurrence of physical violence possible. In contrast, actual violence never occurs in the Umbeck model since each person can "costlessly determine how much labor others are willing and aable to allocate to a particular conflict." Resources are not expended in violence

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[27]Ibid., 58.

"because no one would fight if the outcome were already known in advance. The loser, knowing that he will lose, will just give up his claim to the land."[28] Since the theory is concerned only with contractual agreements (treaties), the costs of entering into contracts are assumed to be small.

Finally, the wealth of each group is not assumed to be constant or equal. An increase in wealth of whites translates into an increased ability to use force, depending upon the rate at which additional wealth can be transferred into weapons or troops. The additional wealth may also create a greater willingness to pay for land as the wealth can be used to offer a higher purchase price. The total willingness to pay is the sum of two components, 1) cash or other forms of direct payment, and 2) investments in force or threats of force.

Given the assumptions of the model, each group must compare the expected costs and benefits of alternative methods of acquiring additional wealth. Wealth could be obtained through peaceful negotiation or through violent conflict. If the expected net benefits from negotiation exceed the expected net benefits from violence, negotiation would be preferred and vice versa. The decision to negotiate a non-violent resolution to a dispute, therefore, depends on the existence of gains from trade which exceed the gains from fighting.

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[28]Umbeck, 41.

The Settlement-Litigation Approach

The question of how disputes are resolved has been pursued in the law and economics literature in the context of legal conflicts. Here disputants decide whether to settle or litigate depending on the expected outcome from each course of action. This dispute resolution literature has been thoroughly reviewed in an article by Robert Cooter and David Rubinfeld.[29] In this framework, "legal disputes are resolved at various stages of a sequential decision-making process in which parties have limited information and act in their own self-interest."[30]

Any dispute which culminates in an adversarial trial has passed through three stages along the way. In the first stage of dispute resolution, an event occurs in which one party harms another. The party that has allegedly suffered harm decides whether to assert a legal claim in the second stage. Here the decision maker must compare the costs of asserting the claim with the expected benefits from acquiring or maintaining the territory in dispute. The third stage in the dispute resolution process is characterized by bargaining. If the disputants cannot reach a settlement in this stage, they proceed to the fourth stage which is litigation. But if a cooperative agreement is reached in the third stage, the

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[29]Robert D. Cooter and Daniel L. Rubinfeld, "Economic Analysis of Legal Disputes and Their Resolution," Journal of Economic Literature 27 (September 1989): 1067-1097.

[30]Ibid., 1068.

process ends. "A decision at each point in the process depends crucially on the parties' expectations about the future."[31]

Disputes between Indians and non-Indians on the American frontier can be analyzed using this same framework. In the first stage both Indians and non-Indians make decisions about potentially harmful actions with regard to appropriate levels of precaution. On the frontier, settlers had to balance the cost of encountering hostile Indians, or any other dangerous group, against the costs of avoiding harm. In the 1840s "great hordes" of emigrants moved west to Oregon and California. Many of these traveled by sail around Cape Horn or crossed through the Isthmus of Panama.[32] While many factors enter the decision to sail to California or travel there by covered wagon, the dangers, real or imagined, of encountering various Indian groups most certainly played a role. By sailing emigrants decreased the harm done to the Plains Indians and avoided the dangers of travelling by covered wagon. But the great majority of emigrants traveled through Indian country increasing the frequency of harm. Indians, on the other hand, could avoid conflict with settlers by moving to areas less likely to be traversed or settled, but moving was also costly.

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[31]Ibid., 1071.

[32]Prucha, The Great Father, 115.

Another way that one side may be harmed is through a breach of treaty stipulations. Each side, at times, may have seen advantages to breaking some treaty requirement. But there were also costs which often depended upon whether the treaty partner was able to determine if the contract had been broken and, if so, what the reaction of the partner would be. In each case a balance must be struck between the costs of harm and the costs of avoiding it.

If the two parties can bargain prior to the harmful event, an outcome could be achieved which is beneficial to both. Often, however, bargaining prior to the harmful event is not possible because it is too costly. Problems with language, differing notions of property rights, the degree to which previous treaties have been adhered to, and the possibility that harm may be committed accidentally all constrain the ability to negotiate. When the costs of bargaining between the parties are prohibitive, "the balance between harm and the cost of avoiding it must be struck by law, not the market."[33] The problem though, is that Indians in the 1800s were not subject to the laws governing land tenure or any other laws of the United States. Hence, threats of trial and imprisonment were ineffective leaving only negotiation and war as the means of resolving disputes over land.

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[33]Cooter and Rubinfeld, 1069.

In the second stage the harmed party decides either to assert a claim or to allow the injurer to continue the harmful action, thereby giving up any previously held claim. At this stage, the costs of asserting the claim must be compared to the subjective value of the claim. If settlers trespass on land claimed by Indians but which is of little value to them, the tribe may only assert a claim if the costs of doing so are quite small. Asserting a claim requires costly investments such as marking territory or establishing a reputation for dealing harshly with intruders. Sending tribal leaders to Washington was another costly way of asserting a claim.

As in the Umbeck analysis, the assertion of a claim must be a credible one. If settlers wanted to assert a claim to a valuable parcel of land but had no means to acquire or maintain it by force, a stronger claimant would simply take the land. Therefore the value of the claim to a sufficiently weak settler is zero. Negotiation is possible only if the settler can forcefully defend the claim against others who value and assert rights to the land. Also, because of uncertainty, differing expectations about the outcomes in future stages may make negotiation more or less likely.

The third stage involves bargaining or negotiation after an assertion of legal claim. At this stage, "the interests of the two parties diverge with respect to division of the surplus, but converge with respect to an efficient resolution of the dispute. A legal dispute is resolved efficiently when

legal entitlements are allocated to the parties who value them the most, legal liabilities are allocated to the parties who can bear them at least cost, and the transactions costs of dispute resolution are minimized."[34] In the context of Indian-white relations, the cooperative outcome of the bargaining process is a treaty or some other contract which determines the use rights to the land. The noncooperative outcome is war.

The decision to settle rather than go to war requires the existence of a surplus of the gains from trade over the gains from war that can be distributed between the two parties. The costs of war (CW) and the costs of settlement (CS) to both Indians (i) and whites (w) make up the two main components of the surplus. These components are (1) the difference between the costs of war to Indians and whites ($CW_i + CW_w$) and the costs of settlement ($CS_i + CS_w$) and (2) the difference between the subjective evaluation by whites of what they expect to lose at war (WL_w) and the subjective evaluation by Indians of what they expect to gain (WG_i). The surplus is defined

$$(1) \qquad S = \{(CW_i + CW_w) - (CS_i + CS_w)\} + [WL_w - WG_i].$$

If the surplus is negative, both sides prefer war to any possible settlement making inevitable. If the costs of war increase or the costs of settlement decrease ceteris paribus,

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[34]Ibid., 1070.

the value of the surplus will increase and war will become less likely.

Uncertainty about the outcome of war requires that expectational terms be included in the surplus equation.[35] First, for simplicity, let $CW = (CW_i + CW_w)$ and $CS = (CS_i + CS_w)$. The subjective probability of Indians winning WG_i in war is P_i and the subjective probability that whites will lose WL_w is P_{ni}.[36] The surplus is now defined

$$S = CW - CS - (P_i WG_i) + (P_w WL_w) \quad (2)$$

The surplus is positive only when

$$CW - CS > P_i WG_i - P_w WL_w, \quad (3)$$

which suggests that settlement is more likely the more pessimistic Indians are about their chances of winning in war, the larger the white's estimate that Indians will win in war, and the lower the value of the land in dispute. If the costs of war increase or the costs of settlement decrease, the chances that war will occur are diminished.

In the negotiation process, each party has some threat value which is derived from its expectations about the outcome of war. "Any change that strengthens one side's threat value

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[35]This part of the analysis is borrowed from Terry L. Anderson and Fres S. McChesney, "War or Peace? An Economic Model of Indian-White Relations." Working Paper 91-17. Bozeman, MT: Political Economy Research Center, 1991.

[36]The analysis does not depend on whether whites initially harm Indians or vice versa. In this analysis, Indians are the defendants. There is no substantial change if whites are treated as defendants.

should increase its gains from bargaining."[37] Changes in the comparative advantage in the use of force alter the range of possible settlement points and affect the terms of trade. Whites can decrease their expected losses from war, net of war costs, by increasing the number of troops in the area. While this decreases the size of the surplus, it limits the bargaining position of the Indians.

This distributional aspect of bargaining concerns the division of the surplus. How the surplus gets divided is primarily a matter of the relative bargaining strengths of the two parties. Bargaining strategies are used by both sides to shift the terms of trade in their favor. Strategic behavior though is a "source of instability that can lead to bargaining breakdowns."[38] Bargainers must balance the benefit of strategic behavior, which is a larger share of the stakes, against a higher probability of war.

The fourth and final stage in the dispute resolution process is war. The amount that each side expects to win or lose in war depends largely on the efforts they devote to winning or avoiding loss.

The analysis changes when the decision makers do not bear the costs or reap the benefits from actions taken in the various stages. In many cases decisions about whether to negotiate with Indians or fight with them over some piece of

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[37]Cooter and Rubinfeld, 1075.

[38]Ibid., 1078.

land was made in Washington by government officials. In that case, the economics of collective choice and political decision making must be considered. A public choice analysis is briefly discussed in Appendix A.

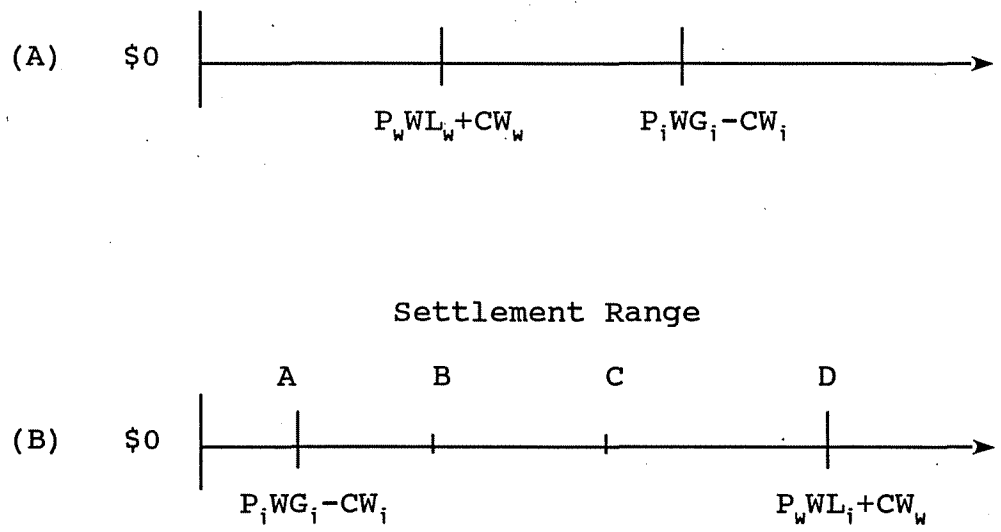
A Theory of Force in Voluntary Trade

As discussed earlier, a mutually beneficial agreement between the disputants can only occur when the gains from settlement exceed the gains from fighting, in which case the surplus from negotiation is positive. The size of the surplus defines the settlement range.

In any trade, the settlement range is bounded by the maximum amount the buyer is willing to pay and the minimum amount the seller is willing to accept. But when the threat of violence plays a critical part in the negotiations, the expected outcomes of war define the bounds of the settlement range.

As before, P_i is the Indians' estimated probability that WG_i will be won if costs of CW_i are expended in war. Similarly, P_w is the whites' estimated probability that WL_w will be lost if their costs in war are CW_w.

Figure 1[39]



The minimum amount Indians are willing to accept in a negotiated settlement is $P_iWG_i-CW_i$, their expected gains from war. The maximum amount whites are willing to pay for the land to avoid war is $P_wWL_w+CW_w$, their expected losses from going to war. If $P_iWG_i-CW_i$ exceeds $P_wWL_w+CW_w$, the surplus is negative and war is inevitable. A peacefully negotiated settlement is possible and preferred to war only if $P_wWL_w+CW_w$ exceeds $P_iWG_i-CW_i$.

These possible outcomes are represented in Figure 1. Panel (A) represents a case in which the minimum amount Indians are willing to accept is greater than the maximum amount whites are willing to pay. Panel (B) represents the case in which a positive surplus exists.

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[39]William F. Shughart III, Antitrust Policy and Interest-Group Politics (New York: Quorum Books, 1990), 146.

Given that a surplus exists, the question of how the surplus will be distributed between the two parties cannot yet be answered. Any point between A and D in Panel (B) is a possible settlement price. It is here that the interests of the two parties diverge. Indians would, ideally, like to acquire the entire gains from trade by negotiating a price at point D. Whites would also like to capture the entire surplus by inducing Indians to accept the price represented by point A.

Whatever form the negotiation process may take, the intentions of each party are clear: Each would like the opposing side to believe their threat point (their maximum willingness to pay or minimum acceptable offer) makes the settlement range smaller. For example, in Panel (B) whites would like to convince Indians that the maximum they are willing to pay to avoid war is at point B. Similarly, Indians would like to convince whites that the minimum price they will accept is point C. This process will continue until some price and hence the division of the surplus is agreed upon.

Until an agreement is actually reached, there is no guarantee that any trade will occur. If Indians bind themselves to point C and whites to point B, the process will break down and war will ensue. The possibility of war occurring even though a surplus exists increases if the two parties expect to be involved in similar disputes in the future.

Each side can alter its threat points by changing P, WL, WG or CW. This can be done in one of two ways; (1) making investments which actually change these variables or (2) by convincing the opposing side that the variables are different from what they actually are.

An investment will be undertaken if the expected benefits from improving the terms of trade exceed the costs of the investment. For example, the Army may decide[40] to build an additional fort in Indian territory if it is expected to intimidate the Indians into accepting a lower price (decreasing P_i) and the reduction in expenditures exceeds the cost of the fort. The fort may also reduce the probability of whites losing in war, P_w, which causes the whites' threat point to increase.

Bargaining strategies which **appear** to shift threat points can take many forms. These strategies have been described as "the ability to set the best price for yourself and fool the other man into thinking this was your maximum offer."[41] Each party will no doubt bluff about its ability and willingness to apply force. However, for purposes of the theory and the econometric study to follow, actual investments in the use of

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[40]This example abstracts from the decision making process of Army officials. For a brief discussion of the Public Choice issues, see Appendix A.

[41]J.N. Morgan, "Bilateral Monopoly and the Competitive Output," Quarterly Journal of Economics (August 1949), quoted in Thomas Schelling, The Strategy of Conflict (London: Oxford University Press, 1968), 23.

force are the primary concern.

Theoretical Implications

The theory provides testable implications about investments in the use of force. Ceteris paribus, these investments should cause the negotiated price of land to change in a predictable direction. Some of these implications are:

1. Increases in either Indian or white populations on or near treaty land should cause increases in prices paid for Indian lands.

2. An increase in the number of Army troops near treaty land should cause the negotiated price of the land to decrease.

3. An increase in the number of Indians killed in previous years should cause the negotiated price to fall.

4. An increase in the number of troops killed in previous years should cause the negotiated price to increase. These implications suggest some of the variables to be used in estimating an equation to explain how prices are affected by changes in the relative abilities of the bargainers to use force.

CHAPTER 4

ECONOMETRIC ANALYSIS AND RESULTS

The theory of the preceeding chapter predicts that changes in relative abilities to apply or threaten force will affect the distribution of the gains from trade and hence prices paid for Indian land. Testing the implications of the theory in the context of Indian-white negotiations requires data on prices and abilities of each side to use force.

The price variable in the model is defined as the price paid to the Indian tribe for the ceded land, divided by the fair market value of the land. Prices paid to Indians are derived from the treaties themselves and are aggregated from the various provisions of each treaty. The forty treaties in the sample were negotiated between 1825 and 1895 by tribes in seven western states: Kansas, Nebraska, North Dakota, South Dakota, Colorado, Montana and Wyoming. The treaties in the data set were chosen because the task of aggregating the forms of payment into a single dollar figure had been accomplished and reported by Wishart.[42]

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[42]David J. Wishart, "Compensation for Dispossession: Payments to the Indians for Their Lands on the Central and Northern Great Plains in ths 19th Century," National Geographic Research 6 (January 1990): 94-109.

Fair market value has been determined by the courts in 20th century Indian claims cases. In these cases the courts tried to determine the value of the land by considering location of the cession, proximity to markets and transportation, and known resources at the time of the cession. The court did not take into account subsequent developments on the land. "Fair market value, then, is an informed estimate of what White Americans would have paid for the land at the time it was taken."[43] The validity of the fair market value for each cession rests on the assumption that the value determined by the courts is accurate. This is a reasonable assumption to make because the two parties in the claims cases would be unlikely to allow inaccuracies go unchallenged. Appendix B presents prices for each treaty in the data set.

The use of the percent of fair market value as the dependent variable eliminates the need to explain differences in land values with variables such as agricultural productivity. Instead, only those variables which might cause prices paid to Indians to differ from prices paid to or by whites need be used. As the theory predicts, the difference in prices for these two markets can be explained by variables reflecting variations in relative abilities in using force.

The independent variables used as proxies for threat potential are: number of Army troops near treaty land,

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[43]Ibid., 108.

numbers of Indians killed in previous years, and population densities near treaty land. A dummy variable has also been included to measure the effect of a structural change which occurred in 1880 as the tribes moved without resistance to their reservations.

The number of army troops in each observation is defined as the number of troops within a 200 kilometer radius of the negotiation site. These figures were derived from estimated troop populations at military posts in the West.[44] Casualty data come from compilations of records on Indian battles.[45] The variable representing Indians killed is defined as the number killed in the year preceeding the treaty negotiations in the state these negotiations took place. The casualty figures allow for a lagged effect on prices paid for land. Population densities are for the state and year in which the treaty was negotiated. These figures were collected once each decade and therefore had to be interpolated for the intervening years.[46]

Data on other important variables were sought for purposes of estimation but simply could not be obtained.

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[44]Francis Paul Prucha, A Guide to the Military Posts of the United States 1789-1895, (Milwaukee, WI: The North American Press, 1964).

[45]Joseph P. Peters, Indian Battles and Skirmishes on the American Frontier 1790-1898 (New York: Argonaut Press Ltd., 1966).

[46]U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the United States (Washington, D.C.: U.S. Government Printing Office, 1975).

Foremost among these was a qualitative variable describing a tribes' reputation. The theory predicts that tribes with reputations for ferocious treatment of adversaries would be paid higher prices for land, ceteris paribus. Another of these variables is a dummy for the date of introduction of technological innovations such as the repeating rifle. The observations however, are not sufficiently continuous for the effects of these innovations to be captured.

Test Models and Results

The structural form of the equation explaining percent of fair market value paid to Indians is written

$PERCENT_i = a_0 + a_1 POPDEN_i + a_2 INDKILD_i + a_3 TROOPS + a_4 EIGHTY_i + e_i$, where

$PERCENT_i$ = Percent of fair market value paid to Indians for cession i

$POPDEN_i$ = population density in the state of cession i; a weighted average when cession lies in two or more states

$INDKILD_i$ = number of indians killed in battles in seven state region for year preceeding cession i

$TROOPS_i$ = number of troops within 200kms of cession i

$EIGHTY_i$ = dummy variable for 1880, 0 prior to 1880, 1 for 1880 and years following

e_i = disturbance term.

Empirical Estimation of Treaty Price Model

Ordinary least squares (OLS) was used to estimate the structural equation. The results of the OLS regression are provided in Table 1.

Table 1. OLS Regression Results.

Variable	Coefficient	t-statistic	Predicted sign
POPDEN	6.2	2.15	+
INDKILD	-0.114	-0.79	-
TROOPS	-0.004	-0.63	-
EIGHTY	20.29	1.49	?
CONSTANT	40.03	4.64	
ADJ. R^2	.26		
Sample size	40		

These OLS estimates of the coefficients, however, are not accurate because of problems with the data. This is because not all of the assumptions of the model are met, namely multicollinearity and a censored or limited dependent variable. Since the first problem reduces significance of the coefficients and the last leads to biased estimates, correcting for these problems is in order.

Multicollinearity arises because there is an approximate linear relationship in the data set between the number of Indians killed and the number of troops which follow a very

similar time trend. This problem was corrected by dropping one of the two highly correlated variables from the regression. Two alternative specifications of the model result; one includes the TROOP variable and omits INDKILD and the other includes INDKILD and omits TROOP.

Table 2 presents the Ordinary Least Squares regression results. The results from the OLS model suggest that population density was an important factor affecting prices. An increase in population density caused an increase in the percent of fair market value received by Indians. A higher population density in a state should reflect an increased willingness to pay for Indian lands and a decreased willingness to engage in warfare since war in heavily populated areas would be more costly than in sparsley populated areas. The estimated coefficient for the POPDEN variable is significantly different from zero at the .05 level.

The second problem with the data involves the dependent variable. Percent of fair market value has a limited range, taking only values between zero and 100. In some cases the independent variables may predict values of the dependent variable which lie outside this range, but these values are reported at the limit as either zero or 100. For example, in those treaties for which the government paid nothing to the tribes, the data may predict that the tribe should have been paid even less or that the tribe should have paid the

government.

To illustrate, consider a tribe that owns 100 acres of land for which it was paid nothing when all 100 acres were acquired by the government. Given the relative abilities in the use of force, population density and other factors, it may be that the tribe should have turned over 150 acres to the government. But since the tribe only owned 100 acres, it should have paid the government the value of the additional 50 acres.

Other observations show the government paying 100 percent of fair market value. These payments in fact may have exceeded fair market value which, for claims cases, meant that no additional compensation was required. The independent variables, however, may predict values greater than 100 percent. A tobit model was used to allow for estimation using data with a limited dependent variable.[47]

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[47]For a detailed exposition of the tobit regression model, see William H. Greene, Econometric Analysis (New York: Macmillan Publishing Company, 1990).

Table 2. Estimated Coefficients for OLS Model.

	Specification 1	Specification 2
Dependent	Percent	Percent
Explanatory		
POPDEN	6.26	6.14
	(2.14)	(2.15)
INDKILD		-0.189
		(-2.26)
TROOP	-0.008	
	(-2.20)	
EIGHTY	20.91	20.36
	(1.55)	(1.51)
CONSTANT	40.01	38.64
	(4.66)	(4.67)
	R^2 = .33	R^2 = .33
	SSE = 37.07	SSE = 36.95

Table 3. Estimated Coefficients for Tobit Model.
Lower limit = 0 Upper limit = 100

	Specification 1	Specification 2
Dependent	Percent	Percent
Explanatory		
POPDEN	16.14	16.17
	(2.25)	(2.20)
INDKILD		-0.376
		(-2.30)
TROOP	-0.022	
	(-2.39)	
EIGHTY	32.36	32.03
	(1.21)	(1.19)
CONSTANT	47.13	41.27
	(5.38)	(2.70)
Squared Corr. = .34		Squared Corr. = .34
SSE = 38.15		SSE = 38.53

n = 40; Asymptotic t-values are listed in parenthesis; SSE = standard error of the estimate.

The estimated coefficients for the INDKILD and TROOP variables have the predicted signs and are significantly different from zero at the .05 level. While the estimated coefficient for EIGHTY has a positive sign, the null hypothesis that the coefficient is different from zero cannot be rejected at any meaningful level of significance. It should be noted that the dummy for 1880 was included in the model to test whether structural change occurring at this time had an important effect on prices paid for Indian land. This variable, it appears, was not important. Excluding EIGHTY from the regression does not change the results in any meaningful way. It should also be noted that a variable was included for numbers of army troops killed but was insignificant and did not affect the regression results.

The results for the tobit model are presented in table 4. The estimated coefficients on POPDEN, INDKILD and TROOP again have the predicted signs and are significantly different from zero at the .05 level.

Comparing the results from the tobit model with the results from the Ordinary Least Squares model suggests that the limited dependent variable does not present a serious problem for the data used in estimating the structural equation. In other words, the observations on PERCENT which fall at zero and 100 are not severely restricted by the existence of these limits.

Conclusion

The OLS and tobit estimations of the structural equations, as presented in tables 3 and 4, are generally supportive of the theory which suggests that relative abilities in using and threatening force affected prices paid to Indians for land in the nineteenth century. Population density, numbers of Indians killed in the year prior to the negotiation of the treaty, and numbers of army troops near the negotiation site each show significant influences on the variation in prices paid. For example, in specification 1 for the tobit model, an increase of 100 troops causes the percent of fair market value to decrease by 2.2 percentage points. The estimated coefficients and their t-values are consistent for both specifications of the structural equation and for both estimation techniques.

Chapter 5

SUMMARY AND CONCLUSIONS

Summary

The thesis has presented an historical account of Indian-white relations in the 1800s. A theory of force in voluntary trade was developed and used to explain why Indians were paid less than fair market value for their lands. The theory postulates that relative military strengths of Indians and the U.S. government was an important determinant of the outcomes of negotiated treaties.

The empirical evidence lends support to the theory. The regression results suggest that proxies for military strength such as casualties and numbers of troops affected prices paid to Indians in predictable ways.

Conclusions

The elasticity of force is a useful concept for understanding how changes in the ability to use force affect prices agreed upon in negotiated settlements. American Indian treaties in the 1800s are an important example of this elasticity. In contrast with the Umbeck analysis, the variance in abilities of the government and Indian tribes to

use force allows for testing the effects of differential force.

The conclusions for the Indian-white context support the idea expressed by Umbeck that all allocative systems are based on force. Accordingly, the role of force should be considered even when peaceful negotiations are under study. The theory presented in this thesis could be tested in other contexts to determine the importance of force in different allocative systems.

Finally, the thesis provides a framework in which current controversies about Indian land claims can be analyzed. The idea that Indian lands were unjustly taken from them and that compensation should therefore be paid, while valid, must be accompanied by an understanding of the reasons why prices paid in the 1800s for Indian land were lower than fair market value. The threat of force was one important reason.

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APPENDICES

APPENDIX A

Public Choice Considerations

APPENDIX A

The pubilc choice issues which arise from the Indian-white context do not alter the analysis in any fundamental way. The primary problem concerns wealth. Whites on the frontier may have had no more wealth than Indians. Each had some basic necessities to sustain life including horses, shelter, food, tools and weapons. But whites had one additional advantage that the Indians lacked. Whites had some ability to call on government troops for protection. This form of wealth was the primary difference between the two groups.

The decision making process of Congress was also subject to public choice considerations. The Congressional decision to provide an additional dollar for purchase of land or an additional dollar for the Army to take land by force was most certainly influenced by Army officials. Incorporation of these the public choice issues into the theory serves to further complicate the picture while adding little understanding of the basic problem.

APPENDIX B

Treaty Data

APPENDIX B

Date of Treaty	Tribe	Price/Acre (in cents)	Percent
3 June 1825	Kansas	0.5	100.0
15 July 1830	Otoe & Missouria	2.2	100.0
21 Sept. 1833	Otoe & Missouria	4.1	6.7
9 Oct. 1833	Pawnee	1.1	3.4
14 Jan. 1846	Kansas	3.2	7.5
6 Aug. 1848	Pawnee	1.8	2.1
23 July 1851	Sisseton & Wahpeton	12.5	31.9
15 Mar. 1854	Otoe & Missouria	42.6	42.6
16 Mar. 1854	Omaha	17.8	30.4
24 Sept. 1857	Pawnee	21.7	43.4
2 Mar. 1858	Ponca	19.5	19.5
19 Apr. 1858	Yankton	14.9	12.3
3 Oct. 1859	Kansas	157.0	100.0
2 Oct. 1863	Chippewa	8.1	18.1
6 Mar. 1865	Omaha	50.0	100.0
29 Apr. 1868	Sioux	0.0	0.0
7 May 1868	Crow	3.6	10.9
10 May 1868	Cheyenne & Arapahoe	5.1	11.0
8 May 1872	Kansas	197.0	100.0
20 Sept. 1872	Sisseton & Wahpeton	8.6	5.7

22 June 1874	Omaha	664.0	100.0
19 Aug. 1874	Blackfeet	0.0	0.0
13 Apr. 1875	Assiniboine	0.0	0.0
15 Aug 1876	Otoe & Missouria	385.0	100.0
28 Feb. 1877	Sioux	0.0	0.0
16 March 1877	Ponca	38.4	17.5
13 July 1880	Ft. Berthold	0.0	0.0
3 Mar. 1881	Otoe & Missouria	1222.0	100.0
11 Apr. 1882	Crow	48.3	100.0
10 July 1882	Crow	464.0	100.0
7 Aug. 1882	Omaha	900.0	100.0
1 May 1888	Blackfeet/ Gros Ventre	287.0	36.0
2 Mar. 1889	Sioux	57.0	100.0
12 Dec. 1889	Sisseton & Wahpeton	250.0	100.0
3 Mar. 1891	Ft. Berthold	44.0	31.0
27 Aug. 1892	Crow	78.2	100.0
22 Oct. 1892	Chippewa	12.5	1.9
31 Dec. 1892	Yankton	298.0	45.0
26 Sept. 1895	Blackfeet	188.0	100.0
9 Oct. 1895	Assiniboine/ Gros Ventre	900.0	100.0