

Late Homesteading: Native Land Dispossession Through Strategic Occupation

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Abstract

U.S. homesteading has been linked to establishing federal economic property rights over western lands where sovereignty was threatened by the Confederacy, foreign powers, and the Indian Wars of the mid-nineteenth Century. However, the bulk of homesteading actually took place in the early twentieth century, long after these threats to federal ownership ceased. We argue that this “late homesteading” was also an effort to enforce federal property rights, but in response to a different threat — a legal one. Turn of the twentieth century federal land policies dispossessed massive amounts of Indian treaty lands, and exposed the federal government to legal, rather than violent, conflict. Late homesteading was used to make the dispossession permanent, even in cases where legal disputes were lost. Using data on the universe of individual homesteads, and linking these with federal land cessions across the sixteen western states, we find evidence consistent with this hypothesis.

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[w]here non-Indian settlers flooded into the opened portion of a reservation and the area has long since lost its Indian character, we have acknowledged that de facto, if not de jure, diminishment may have occurred.

[Solom v. Bartlett 465 U.S., at 471, (1984)]

1. Introduction

Homesteading in the United States was created through the 1862 Homestead Act and effectively ended in 1934.¹ Under this Act, settlers acquired 160 acres of land by being the first to register a claim, pay a \$10 filing fee, and then improve and occupy the land for five years. Historians tend to divide the homesteading era in two: the first phase between 1862–c.1890; and the second phase from c.1890–1934 (*e.g.*, Edwards *et al.* p. 12, 2017). Economists, in contrast, make no distinction and mostly focus on the first thirty years of homesteading.² This difference no doubt arises from the economist’s interest in homesteading as a method of *initially* establishing federal economic property rights, and homesteading’s signature wealth dissipation through the initial rush to make a claim (Anderson and Hill, 1990).

Ignoring the entire span of homesteading, however, hides a major homesteading fact: the bulk of homesteading took place between 1900–1930. Between 1860–1880 homesteading got underway in states just west of the Mississippi, and this was followed by significant amounts of homesteading until the early 1890s. Then, between 1895–1930 massive amounts of homesteading took place that amounted to 69% of all the homesteads issued from 1862–1960.

¹ Officially, homesteading lasted until the Federal Land Policy and Management Act in 1976, but very few claims were filed after 1934.

² Early economic studies (*e.g.*, Southey (1978), Stroup (1988), Anderson and Hill (1983, 1990)) were concerned with dissipations caused by homesteading’s inducement to race, and made no distinction regarding when the homesteading took place. Allen (1990, 2019) and Barzel (1997) were also concerned with the initial phase of homesteading to establish property rights in light of the Confederacy, international threats to sovereignty, and the violence of the Indian Wars. Others (*e.g.* Campbell (1999) and Allen and Leonard (2020)) examined the Oklahoma homesteading experiences of the 1890s.

Cash sales were the main alternative to homesteads in transferring title to private individuals. Until the turn of the twentieth century there was a cycle: homesteading came first, followed by land sales; with about four waves of such settlement until 1900. Then, homesteading relative to cash sales took off, and by the early 1930s there were more than twenty times the number of homesteads being patented relative to cash sales. We call the surge in absolute and relative homesteading, “late homesteading.”

Late homesteading presents several puzzles. First, it took place in the Progressive era, a time when the “open” frontier was supposedly “closed,” and there was a general sense that resources in the West had become too scarce to give away.³ By the 1890s the western lands had been surveyed, and there was a government priority to map out and measure western resources to assess the inventory of state holdings. During this period the federal government restricted open-ended privatization of the west: commuting (land sales through the Homestead Act) was terminated; national parks, forests, and grasslands were created; and a general philosophy of federal land management to avoid ‘corruption,’ ‘exploitation,’ and ‘speculation’ was developed.⁴ Late homesteading was incongruent with the Progressive Era. Why, as the federal government began to exercise such control over the west, was so much land left in the public domain to be grabbed by homesteaders?

Second, late homesteading seems inconsistent with the explanations of earlier homesteading. Allen (1991, 2019) and Barzel (1997) have argued that homesteading encouraged

³ Frederick Turner, citing the 1890 census, famously declared the “closing of a great historic movement.” By 1890 “the frontier” was no longer “a place in the census reports” (Turner, p. 199, 1966).

⁴ Gregg, pp. 258–260 (2019), discusses the role of the Progressive philosophy on the vision of western land use.

... beginning in the late nineteenth century policymakers began to restrict the unbridled exploitation and privatization of the nation’s natural resources. ... Twentieth-century homestead laws were emblematic of Progressive Era experimentation with federal policy-making and driven by a larger national reckoning with the role of government in crafting land and resource policies.

[pp. 259–260, 2019]

Hays (pp. 67–68, 1999) also argues that progressive movement was driven by closing “loopholes which permitted illegal entry and especially to prevent use of the homestead laws to acquire nonagricultural resources.”

rapid occupation of territories claimed by others (*e.g.*, the Confederacy, Native Americans, Mexicans, and the British).

Occupation through homesteading established meaningful economic property rights to the frontier for the United States — especially when combined with the railroad land grants between 1862–1871 — and enabled U.S. land sales and other development by supporting U.S. sovereignty over the West. However, by 1890 the west was secure; the Confederacy, the British, and others gone; and there was no serious threat from Native tribes who, by this time, had been decimated through military conflict, dispossession, and loss of numbers. If there was no threat to U.S. sovereignty during an era of restrictions on the privatization of western lands, then why did the federal government not only continue the rent-dissipating practice of homesteading, but actually expand it?

Finally, late homesteading took place under and after revised homesteading laws. From 1890–1916 Congress passed a series of new homestead legislation that expanded homesteading on some dimensions, but greatly constrained it on others. The systematic alteration of homesteading laws indicate that late homesteading was the result of a deliberate choice by the federal state. Late homesteading was not simply a by-product of increased immigration, nor the result of settlers exploiting nineteenth century regulations that had become loopholes in a new century, nor the consequence of a take-over by states interested in increasing the size of their populations for political power.

We develop a hypothesis to explain late homesteading that is consistent with earlier theories. Whereas early homesteading was a response to external military threats, we suggest late homesteading was a response to internal legal threats against the federal government. These legal threats arose out of the government’s dubious land dispossessions of Native tribes. Although the federal government entered into hundreds of treaties with tribes, some were signed under duress, others later unilaterally changed, and still others were simply never ratified and ignored by the federal government. If the government anticipated legal challenges and losses over these takings, then flooding the lands with settlers could lead to “*de facto*, if not *de jure* diminishment” of the Native rights to the

land.⁵

Settler occupation of indigenous lands entailed disruption of tribes’ land uses, physical development and infrastructure, and the presence of vested interests in maintaining settlement. These irreversible effects of settlement meant that even a future legal loss could only result in a payment to tribes, not the return of the land. This reduction of the tribal land base furthered federal efforts to continually diminish tribes’ sovereignty, which was inextricably linked to their ownership of the lands that comprised their territories (Carlos et al., 2021). Hence, the distinguishing feature of homesteading — the requirement to occupy the claim — continued to serve the federal government’s strategic interests long after the threat of violent conflict had abated.

We show that changes to the internal structure of homesteading were consistent with the hypothesis that late homesteading was intentional, and that developments in the government’s policy toward indigenous lands in the late nineteenth century left the state open to legal challenges. After reviewing the qualitative evidence in support of our hypothesis, we use the universe of General Land Office (GLO) homesteading land patents and cash sales from 1862-1940, matched with the land cessions, treaties, and reservations across sixteen western states, to show that late homesteading was a targeted policy of dispossession through occupying specific lands; namely, the lands taken and occupied were the ones most subject to legal challenges.⁶

⁵ This was the language used to describe legally dubious land takings in *Solem v. Bartlett*, 465 U.S. 463 (1984), in which the U.S. Supreme Court developed the “diminishment doctrine.”

⁶ Virtually all of the western lands we examine were legally ceded by tribes to the federal government. We use the term “taken” to describe lands that were ceded in a questionable way that left the door open to a future court challenge of a treaty violation.

2. Background on Homesteading

2.1. The Economic Rationale for Early Homesteading

Homesteading began in the heart of the Civil War, and at a moment when it was unclear which side would win and ultimately take hold of the West. Homesteading was a Union policy, designed for loyalists and others who never took up arms against the Union.⁷ Very quickly, homesteading moved from a policy of northern occupation of the West against the Confederacy, to white occupation against Native tribes. Occupation of an area was aided by subsidized railroad construction that raised the value of land and encouraged more rushing to targeted areas. Early homesteading was used in conjunction with a policy of treaty-making that granted large tracts of lands to tribes that were to be “separate” areas from white settlement (these areas were heavily located in Montana, the Dakotas, and Oklahoma). As the waves of early homesteaders moved into the West, they established enough security of federal title in lands ceded from the tribes that lands sales to private citizens quickly followed (Allen 2019).

During the early homesteading era (1862–1890), the most critical concern for the General Land Office was the occupation of ceded lands by an “actual settler,” even if proper protocols were not followed.⁸ As a result, there was a steady stream of Congressional acts regarding homestead “fraud.” The most serious type of fraud was “speculation” — the practice of filing a homestead claim with the intention of not living on the land (Edwards *et al.* p. 44, 2017). It did not practically matter if the land was surveyed, actual occupation

⁷ The opening paragraph of the 1862 Act states in part: “That any person who ... has never borne arms against the United States Government or given aid and comfort to its enemies, shall ... be entitled to enter one quarter section ...”

⁸ The term “actual settler” is found throughout early documents regarding western settlement. This term always meant someone actually living on the plot of land. According to a Department of Interior bulletin on homestead history (p. 21, 1913) : “...the homesteader was required to establish a residence on his land and to reside thereupon for a period of five years. No definite amount of cultivation was required, but the building of houses and barns and the cultivation of a part or all of the area were regarded as evidence of the good faith of the entryman (*sic*) in entering the land for the purpose of building a home for himself, *this being the fundamental object of the homestead act.*” (emphasis added).

was paramount; indeed, every accommodation was made to squatters to redeem themselves and become homesteaders without penalty. The earlier Preemption Act (1841) had allowed squatters to settle on federal lands ahead of a survey, with the option to purchase lands later. During the early homestead era preemptors were allowed to convert lands to a homestead within three months of a township survey. If squatters ended up on railroad lands, they were allowed to remain, alternative lands were granted to the railroad instead. Once occupation had been established and farming begun, homesteaders were allowed to commute their lands by purchasing them before the five year period was over. In other words, during the early era, there was some flexibility in the application of homesteading as long as an “actual settler” was living on the land — any western land.

2.2. Late vs. Early Homesteads

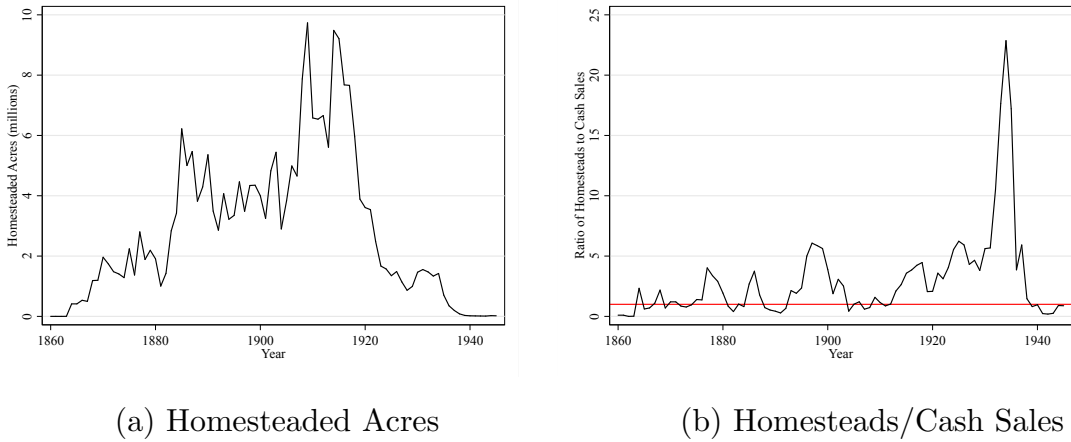
Figure 1 shows two representations of the prevalence of late homesteading. Panel (a) depicts acres of patented homesteads in the sixteen most western states between 1862–1940, and shows there were actually three major periods of homesteading. Panel (b) in Figure 1 presents this a different way, and shows that late homesteading was not just a by-product of increases in private land transfers over time. In Panel (b) the ratio of the number of homestead patents to private land sale patents in any given year is plotted over time (the ratio is 1 along red line).⁹ The upshot of Figure 1 is that, if anything, homesteading became *more* prevalent in the twentieth century, after the frontier was “closed.” Late homesteads differed in important ways, however.

Early homesteading transferred all land, mineral, and timber rights on the plot of the settler’s choosing. With commuting, these rights could be acquired quickly and cheaply. Late homesteading generally did not have this feature. As the Progressive Era got under way, many of these rights were attenuated (Gregg, p. 259, 2019).¹⁰ The General Revision

⁹ A land patent is a title that transfers from the federal government to some other person or agency. Panel (b), therefore, considers patents to individuals in the form of homesteads relative to patents to individuals through cash sales.

¹⁰ The concern was that homesteads were granted to individuals who acquired valuable timber and mineral lands and then immediately sold them to commercial interests. See Hays, (pp. 67–68, 1999) or Robbins (p. xxiv, 1962). Hibbard (p. 390, 1939), in reference to “vast frauds,” claimed that forest lands worth \$20,000 were purchased through commuting homesteads for \$400.

Figure 1: Homestead Arrivals By Year



Notes: Using data on individual land patents from Allen and Leonard (2021), we count total acres patented as homesteads in panel (a) and the ratio of homestead patents to cash sale patents in panel (b), as measures of homestead intensity.

Act (1891) repealed the Preemption Act of 1841, which meant individuals were unable to settle on lands of their choosing and had to homestead on surveyed lands that were opened up to homesteading. Surveyed lands for homesteading had to be unappropriated, not be mineral in character, and not be withdrawn, reserved, incorporated, or otherwise embraced for trade or business (General Land Office, p.2, 1926). This Act also changed the amount of time to commute a homestead from 6 to 14 months (Hibbard, p. 389, 1939), and granted the federal government the right to remove public lands from entry. By 1897 40 million acres had been removed (Clawson, p. 29, 1983), and T. Roosevelt later withdrew another 234 million acres (Hibbard, p. 474, 1939).¹¹

At the turn of the twentieth century other federal acts placed more control over homesteading rights. The Kinkaid Homestead Act (1904), Forest Homestead Act (1906), Enlarged Homestead Act (1909), and the Stock-Raising Homestead Act (1916) all increased the amount of land that could be homesteaded, but at the same time they reserved the

¹¹ According to Hibbard (p. 492, 1939): “Since [1906] ... coal lands are being classified and valued as rapidly as the funds at the disposal of the Survey will permit, and oil, gas, phosphate, and potash lands and lands valuable for water power and reservoir sites are being withdrawn from entry as rapidly as information regarding them is obtained.”

mineral and timber rights to the federal state.¹² These larger plots, combined with irrigation projects stemming out of the Reclamation Act (1902), made dry land farming viable in areas previously constrained to 160-acre homesteads, while at the same time reducing the ability to commute and extract timber or minerals without a market purchase. The Three Year Homestead Act (1912) extended the commuting time to three years, and drastically reduced the ability to assemble large tracts of land quickly through homesteading.

Thus, during the transition to late homesteading, the policy had been re-examined by the federal government, and rather than be terminated, it was redesigned. The ability to use homesteads as a means to capture timber or mineral wealth had been removed; the ability to assemble large tracts of land cheaply was seriously curtailed; and the ability to live on a homestead in semi-arid terrain was made possible (Gregg, p. 258, 2019). What remained was the fundamental character of homesteading: land ownership through first *occupancy* by a settler. The amount of legislation, over a long period of time, suggests that late homesteading was not accidental, not an unintended consequence of some other land policy, and not driven by specific state interests.¹³

Table 1 lists various totals of the number of homesteads in our sixteen state sample.¹⁴ Of the 3,101,053 total homesteads, 2,435,144 (78%) were after 1890. Although there were many types of different homesteads that corresponded to specific legislative acts, the vast majority of late homesteads were created through the original 1862 Act. Of the others, only the Stock Raising Homesteads (created in 1916) were of a significant number. Most notably, the homesteads that emerged from the Enlarged Homestead Act (1909) and the Reclamation Homestead Act (1910) did not account for a large number of homesteads.

¹² The Withdrawal Act (1910) took all coal, oil, gas and phosphate lands out of entry. The Carey Act (1894) granted lands to the states, which then developed irrigation projects and sold water to farmers. Homesteading was allowed, but the land came with no water rights.

¹³ Allen and Leonard (2021) find that early homesteading placed this land on a path of lower development compared to sold lands. This negative path dependence remains even after 140 years, and they find it resulted from homestead farms being located in the way of future commercial activity. This effect was not found for late homesteading. This suggests a more strategic placement of late homesteading, and is consistent with an intentional decision to engage in late homesteading in a cost mitigating way.

¹⁴ Data sources are described in Section 5.1 and 5.2.

Table 1: Early vs. Late Homesteading by State

Type	Numbers of Homesteads	
	Total	Late Homesteads
	(1)	(2)
All Homesteads	3,101,053	2,435,144
Original	2,350,953	1,763,196
Stock	428,380	428,380
Timber	135,372	64,262
Desert	85,516	78,694
Enlarged	70,143	70,143
Reclamation	29,772	29,772
Montana	404,960	395,684
Colorado	349,693	303,274
Wyoming	263,616	259,449
Arizona	55,601	53,449
Nevada	16,138	14,565

Notes: A late homestead is defined as being after 1895.

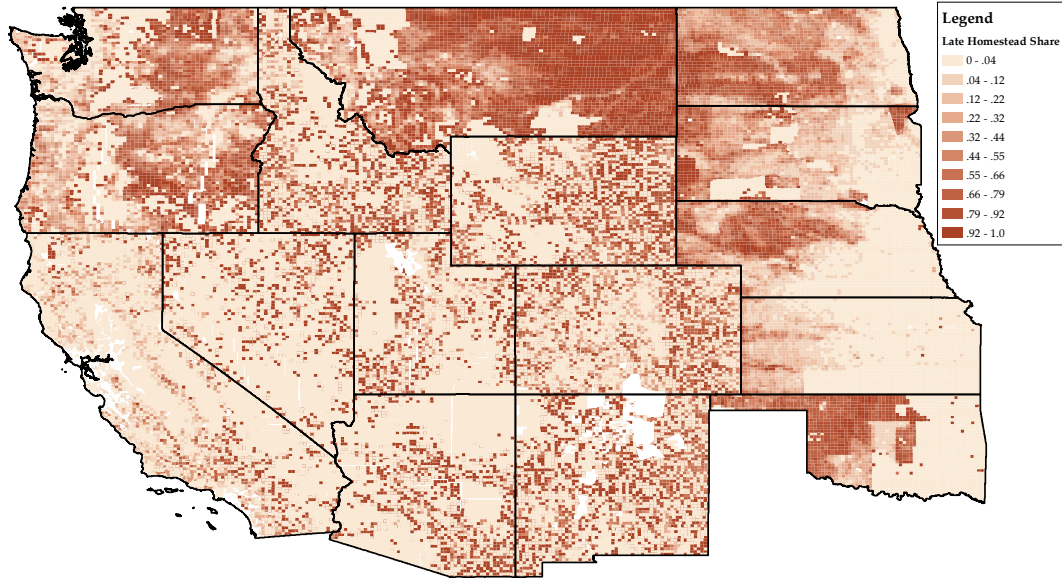
There was a wide variance in the amount of late homesteading across the West. Table 1 reports the totals for the states with the most and least late homesteading, showing that Montana had 27 times the amount of homesteads compared to Nevada. Figure 2 shows the share of late homesteads relative to all homesteads plus cash sales in each 6×6-mile township in our sample.¹⁵ Montana had the most late homesteading, both in terms of totals and percentages. Within states there was also great variation in the amount of late homesteading. For a state like Montana, the percentage of late homesteads out of all land patents varied from as low as 5% in Glacier county, to as high as 80% in Hill county.

3. A Theory of Late-Homesteading

Late homesteading was the consequence of a time inconsistency problem that arose over a sudden change in the the relative power of the American federal state *vis-à-vis*

¹⁵ See Section 4.2 for a description of the land patent data data.

Figure 2: Geographic Distribution of Late Homesteading



Notes: This figure depicts the intensity of late homesteading in each 6×6-mile Public Land Survey System (PLSS) township in the sixteen western states. We define the share of late homesteads as $\text{Late Share} = (\text{Late Homesteads}) / ((\text{All Homesteads} + \text{All Cash Sales}))$, where a homestead is considered “late” if it has an arrival date after 1895. See Section 5.2 for details on the land patent data used to create this figure.

Native American tribes. Prior to *c.* 1870 treaties were made with the tribes because it was in the interests of the federal state to do so. The federal government mostly wanted rights of passage to the coast, forts, and specific homestead lands; and gave up massive tracts of land in exchange because it placed little value on the traditional indigenous lands and lacked the plenary power to confiscate them. However, the cost of not respecting these treaties fell later in the century. By 1890 the plenary federal state could, *de facto*, confiscate tribal lands without concern for widespread violence or political opposition, and did so on a wide scale.

At its core, all homesteading allocated land to settlers by *occupation* through first possession, which either took place through occasional races, or more generally by being first to arrive at a claims office and pay the fee.¹⁶ Thus, when lands were homesteaded

¹⁶ Ownership was ultimately established through continuous five year occupation that involved land im-

some fraction of the land value was dissipated through early occupation.¹⁷ On the other hand, land sales have all of the non-dissipating benefits that allocation by price creates, and so the first-best value of sold land is greater than homesteaded lands.

Homesteading, therefore, is a less valuable means of creating private title in lands, unless there is some benefit of occupation. This benefit arose from the threat of a legal challenge over breaking treaties and taking lands previously held by the tribes. Questionable legal status of western lands meant reduced opportunities for development. By using homesteading to occupy these particular lands, any legal threats against development became moot; the court settlement effectively becomes a forced sale of the land.

Our hypothesis is that the federal state strategically used homesteading to transfer lands away from tribes. Whether they lost a court challenge or not only influenced the price paid, not the transfer. Since homesteading is a costly form of transferring rights, we predict it should be used where there would be a possibility of treaty lands returning to tribes. Our hypothesis makes two broad predictions. First, the probability of homesteading should increase with increases in the probability of losing a court challenge. Therefore, the more legally dubious the land taking, the more likely the lands will be homesteaded rather than sold. Second, the state should mitigate the costs of homesteading. Therefore, as homesteading dissipation increases it should be used less often and federal lands should be sold. Or, alternatively, if elements of homesteading are particularly dissipating, they should be eliminated when homesteading is used.

4. Qualitative Evidence For the Late Homesteading Hypothesis

Suppose a white man should come to me and say, "Joseph, I like your horses, and I want to buy them." I say to him, "No, my horses suit me, I will not sell them." Then he goes to my neighbor, and says to him: "Joseph has some good horses. I want to buy them, but he refuses to sell." My neighbor answers, "Pay me the money, and I will sell you Joseph's

provements and the construction of a home and out-buildings. Ownership was fee-simple, which meant that homesteading's chief alternative was direct cash sale of land to private individuals.

¹⁷ The value of homesteaded areas are not completely dissipated because i) not all lands in an area were homesteaded, and ii) complete dissipation only takes place when all lands or homesteaders are homogeneous.

horses.” The white man returns to me and says, “Joseph, I have bought your horses, and you must let me have them.” If we sold our lands to the Government, this is the way they were bought.”

[Chief Joseph, as quoted in Calloway, p. 228, 2013]

Our hypothesis is that late homesteading was a response to legally questionable takings of indigenous land. A necessary condition for this hypothesis is that there actually was a change in the nature of U.S./tribal land dealings, and that there is evidence of takings that could be later challenged in court. This section provides evidence that both conditions are met.

4.1. The Evolution of “Indian” Land Policy

Until the early nineteenth century, tribes were considered by the U.S. government to have an independent sovereignty, with usufruct and transfer rights to land, along with the ability to enter international treaties (Fouberg, p. 3 2000, Ball p. 10, 2016).¹⁸ In the 1820s-1830s three Supreme court cases known as the “Marshall trilogy,” significantly redefined this understanding. In *Johnson v. McIntosh* (1823) the court ruled that tribes were wards of the state and domestic dependent nations. This upheld earlier European doctrines of “discovery,” that claimed although Native American tribes occupied lands, the ultimate ownership rested in the federal state (Ball, p. 11, 2016; Royce p. 528, 1899), and therefore tribes did not have the right to sell their lands. This case was further supported by *Cherokee Nation v. Georgia* (1831) which found that no independent sovereignties could exist within the United States, despite historical treaties.

¹⁸ Prior to the nineteenth century this was a matter of feasibility, as opposed to legal doctrine. As Royce notes:

it is doubtless true that the recognition of the Indian tribes as distinct nationalities, with which the Government could enter into solemn treaties, was a legal fiction which should be superseded by a more correct policy when possible. But necessity often makes laws, and in this instance force the Government to what was, in its early days, probably the best possible policy

[p. 535, 1899]

In *Worcester v. Georgia* (1832), although tribes were recognized as distinct nations with their own institutions and self governance, Congress was recognized as having a plenary right to protect tribes from state law. In 1834 Congress extended U.S. law on lands occupied by tribes, and forced their laws to be consistent with U.S. law (Ball, pp. 20-21, 2016). Thus tribes were still able to enter treaties with the U.S., but tribal power and authority ultimately rested with the U.S. The President’s right to make treaties lasted until 1871. Subsequent dealings between tribes and the federal government became agreements enacted either through executive order or Congressional legislation.¹⁹

These three cases set the stage for the period of eastern tribal removal. The Indian Removal Act (1830) gave the federal government the authority to move eastern tribes west of the Mississippi in exchange for lands, annuities, and other support, with the removal of the Five Civilized Tribes along the “Trail of Tears” being the most infamous implementation.

The process of moving eastern tribes across the Mississippi required the arrangement of treaties with western tribes. Although these treaties transferred millions of acres of indigenous lands to the federal government, they also established legal property rights to large amounts of land for both western and eastern tribes. For example, the Indian Trade and Intercourse Act of 1834 created permanent lands in the west for eastern tribes that included parts of Texas, Oklahoma, Kansas, and Nebraska (Calloway, pp. 172–173, 2013). However, the movement of eastern tribes into the west, combined with a steady flow of squatters and wagon trains headed for the West Coast, along with a general absence of military enforcement led to a series of conflicts across the Great Basin, Southwest, and Great Plains. Earlier treaties were often considered void, and new treaties were then negotiated.²⁰ Prior to 1870, even these later treaties still contained large tracts of

¹⁹ Spirling notes that this change made little difference to the reality: “... the general trend of rising American government power outweighs the effect of any specific institutional variation in 1871.” (Spirling, p. 85, 2012).

²⁰ The history is extraordinarily complicated, varied, and full of interesting twists. For example, The Five Civilized tribes, being originally from the South, collectively owned 8,000 slaves and sided with the Confederacy during the Civil War (Gibson, pp. 385–389, 1985). The U.S. declared that the lack of allegiance forfeited existing treaties and forced a renegotiation which not only freed the slaves but also transferred lands to the federal government.

indigenous lands, and reflected substantial tribal power in the interior of the continent at that time.

For example, consider the 1851 Fort Laramie Treaty with the eight Great Plains tribes: the Cheyenne, Sioux, Arapaho, Crow, Assiniboiné, Mandan, Hidatsa, and Arikara. In exchange for safe passage for settlers destined for California and the Oregon territory along with rights to roads and forts, the tribes were granted an annuity and recognition of their traditional territorial lands.²¹ The lands given in 1851 were enormous. As shown in Figure A1, they spanned seven states: Montana, Wyoming, North and South Dakota, Nebraska, Kansas, and Colorado.

The discovery of gold in parts of the west, and the increased influx of settlers meant that the 1851 treaty was broken quickly and considered void by the U.S. government.²² Although there was a steady stream of treaties, immediately following the Civil War the Indian Peace Commission set out to reconcile tribes to the coming American settlement.²³ The Medicine Lodge Treaties (1867), along with the second Fort Laramie Treaty (1868) further reduced the land holdings of western tribes, but even still left substantial areas under tribal control. Seldom were the terms agreed to by all parties, and terms negotiated by treaty agents were often altered unilaterally by the Senate. Furthermore, in practice and despite the treaties, the U.S. government often pressed on taking indigenous lands and the tribes subsequently continued raiding. According to Calloway:

Medicine Lodge was the last great treaty council held on the southern Plains and it was one of the very last treaties. The Great Peace Commission was a product of dissatisfaction and demand for change in Indian affairs but it failed to satisfy the dissatisfied or to effect the necessary changes. The commission was intended to bring peace to the Plains but it brought only an appearance of peace. In order to get the Indians to agree to the terms of the treaty, the commissioners had promised them they would be able to continue the very

²¹ Paragraph 69, *Report to the President*, 1868.

²² Fowler, pp. 371–374 (2015), claims that the tribal chiefs “worked to abide by the treaty ... even though the United States violated [the] treaty provisions.” (p. 371).

²³ According to Fowler the subsequent treaties related to the failed 1851 treaty were intended by Congress to obtain the cession of most of the treaty lands (p. 374), and were considered a “swindle” by the tribes. She argues that the Sand Creek massacre in 1864 was the direct product of the failed treaty process (pp. 375–385).

way of life the treaty was designed to terminate. They had persuaded the chiefs to touch the pen to documents the Senate could accept as valid treaties and which ‘gave the stamp of legitimacy to United States efforts to concentrate the Indians and open the region to white exploitation.’ The Indians at Medicine Lodge accepted the peace treaty but rejected the new way of life that came with it, making conflict inevitable with the Americans who invaded their hunting lands.

[p. 213, 2013]

After 1870 the power balance between the western tribes and the U.S. shifted dramatically in the latter’s favor and the federal government flexed its plenary legal powers over the frontier.²⁴ The 1871 Indian Appropriation Act ended the acknowledgment of tribal nationhood and terminated the treaty process. The BIA ceased to recognize tribes’ “domestic dependent nation” status, and all Native Americans were held subject to the laws of the U.S. More significantly, indigenous lands continued to be transferred to the federal government. These transfers came through agreements and executive orders. Within the context of the Indian Wars of the time, if the federal terms were not met, lands were simply taken. Sometimes these takings were explicit, as in the 1877 extinguishment of Sioux off-reservation rights that shrank their lands from 134 million acres to just 15 million (Calloway, p. 234, 2013). Other times, the lands were quietly expropriated.²⁵

4.2. Legal Challenges to Land Takings

While *all* Western lands were ultimately taken from tribes in various ways, our focus is on takings that were potentially dubious from the standpoint of U.S. law. Court challenges made by tribes have a long history in the U.S., and challenges over lost treaty lands are

²⁴ Spirling (2012) uses a textual analysis of all 600 tribal treaties in the US and finds that over time the treaties become harsher in terms of language and land loss, and that this was due to “the general trend of rising American government power ...” (p. 85, 2012). Calloway, referring to the late nineteenth century notes that although US Indian policy had started out “fair and honorable,” it was “reduced, finally, to American armies harrying hungry women, children, and old people through the snow and rounding them up for exile to Indian Territory.” (p. 228, 2013).

²⁵ Another massive transfer worth noting is the Treaty of Guadalupe Hidalgo (1848) took from Mexico territory from Arizona, New Mexico, Nevada, Utah, Colorado, and all of California. It also unilaterally extinguished indigenous land claims in these areas. Thus in California, all indigenous lands were initially taken. Attempts were made to negotiate treaties that included 11,700 square miles of indigenous lands, but these treaties were never ratified. In the end, tribes in California ended up with tiny reservation lands (Calloway, pp. 172–174, 2013).

common. Early cases involving land rights disputes include *US v. Kagama* (1886), *Lone Wolf v. Hitchcock* (1903), *US v. Winans* (1905), and *US v. Winters* (1908). More recently there have been at least eight cases involving the question of “reservation diminishment” that demonstrate i) how uncertain the claims of federal sovereignty are, ii) that occupation by non-tribal residents is a factor in determining ultimate ownership, and iii) that sometimes lands are returned to tribes.²⁶

In *Hagen v. Utah* the court summarized the law in determining whether or not indigenous lands had been “diminished” (the court’s term for a legitimate transfer to the federal state).

... our precedents in the area have established a fairly clean analytical structure, directing us to look to three factors. The ... statutory language used to open the Indian lands. ... the historical context surrounding the passage of the surplus land Acts, Finally, ”[o]n a more pragmatic level, we have recognized that who actually moved onto opened reservation lands is also relevant to deciding whether a surplus land Act diminished a reservation.

[at 411, 1994]

Thus, the occupation of indigenous lands is a factor in determining whether their legal claims to the land have been extinguished, and as the court acknowledged, this is not a matter of law but of practicality. In *South Dakota v. Yankton Sioux Tribe* the court found that non-Native American occupation was relevant for diminishment:

The Yankton population in the region promptly and drastically declined after the 1894 Act, and the area remains predominantly populated by non-Indians with only a few surviving pockets of Indian allotments.

[at 331, 1998]

A similar reasoning is found in *Rosebud Sioux Tribe v. Kneip*:

The longstanding assumption of jurisdiction by the State over an area that is over 90% non-Indian, both in population and in land use, not only demonstrates the parties’ understanding of the meaning of the Act, but has created justifiable expectations which should not be upset by so strained a reading of the Acts of Congress as petitioner urges.

²⁶ These other cases are: *Nebraska v. Parker*, 136 S. Ct. 1072 (2016); *South Dakota v. Yankton Sioux Tribe*, 522 U.S. 329 (1998); *Hagen v. Utah*, 510 U.S. 399 (1994); *Solem v. Bartlett*, 465 U.S. 463 (1984); *Rosebud Sioux Tribe v. Kneip*, 430 U.S. 584 (1977); *DeCoteau v. District County Courts*, 420 U.S. 425 (1975); *Mattz v. Arnett*, 412 U.S. 481 (1973); *Seymour v. Superintendent of Washington State Penitentiary*, 368 U.S. 351 (1962).

[at 430, 1977]

In these cases, it seems that the policy of flooding indigenous lands with homesteaders and other settlers contributed to the long run ownership rights of the federal government.

However, this policy has not always worked. In the *Hagen v. Utah* dissent, Justice Black noted that “Great nations, like great men, should keep their word, ... and we do not lightly find that Congress has broken its solemn promises to Indian tribes.” (at 422, 1994). In *Nebraska v. Parker* the court noted that the Omaha

... Tribe was almost entirely absent from the disputed territory for more than 120 years.
... does not enforce any of its regulations Nor does it maintain an office, provide social services, or host tribal celebrations or ceremonies [on the disputed lands]...

[at 1081, 2016]

However, the court concluded that this “... demographic history cannot overcome our conclusion that Congress did not intend to diminish the reservation in 1882. And it is not our role to “rewrite” the 1882 Act in light of this subsequent demographic history.” (at 1082, 2016). In this case the tribal rights to the lands long since taken were upheld.

Although occupation heavily influences the chance that the federal land takings remain, it has never determined it.²⁷ Indeed, two particular cases explicitly demonstrate that large tracts of indigneous lands can revert back to tribal ownership. In *United States v. Sioux Nation of Indians* (448 U.S. 371, 1980), the court upheld the rights to the Great Sioux Reservation that included the Black Hills, which were part of the 1868 Fort Laramie treaty. In 1876, after a series of battles, Congress forced the Sioux to cede the Black Hills. Litigation began in 1920, and culminated in the 1980 case where the U.S. Supreme Court held that the 1876 Senate Bill S590 which removed much of the Sioux territory from their control was not valid. Rather, the Fort Laramie Treaty of 1868 which had granted these lands was still valid. Although the Sioux were given a financial compensation, *they were not given back the land*. In the more recent case of *Sharp v. Murhpy* (591, 2020), the Supreme Court ruled that the Creek Nation in Oklahoma had not lost title to the

²⁷ In his *Hagen* dissent Justice Black noted “we never have relied upon contemporary demographic or jurisdictional considerations to find diminishment.” (at 441, 1994).

lands given in 1866, despite the fact that the lands in question were heavily populated by non-tribal residents. These lands consist of three million acres in Eastern Oklahoma and include much of Tulsa. In the decision, concern was expressed over how lands occupied by 1.8 million non-Creeks could be practically transferred back, but the original treaty rights were upheld.

4.3. The Allotment Era

Federal policy regarding indigenous lands during the era of late homesteading was dominated by the General Allotment Act (1887) — and subsequent Acts and court decisions that amended it — which gave the federal government the power to unilaterally abrogate past treaties and divide tribal lands into individually owned parcels, varying in size from (usually) 80 to 320 acres (Ball p. 24, 2016).²⁸ The act gave the Secretary of the Interior the power to assign an allotment, even to tribal members who refused to participate. These lands were transferred to individual tribal members, who were intended to take up agriculture and assimilate. The lands were held in trust with the federal government for 25 years, or until an individual allottee was declared “competent” to hold full, fee-simple property. Once gaining fee-simple title, many tribal members quickly sold their land to whites (Meriam, 1928).

The Allotment Act (also known as the Dawes Act for its sponsor Henry Dawes) was extended and supplemented over time. It was applied on a tribe-by-tribe basis, and during the roughly fifty years that the Act was in force, roughly half of western reservations were allotted (Leonard, Parker, and Anderson, 2020). I Tribes generally opposed these

²⁸ An interesting aspect of the Allotment Act was that it gave U.S. citizenship to each allottee (Carlson, p. 34, 1983), which would have, at the margin, encouraged allegiance to the U.S. and migration away from the reserve. According to Wall, “The Allotment Act was the main tool of the assimilation policy, so much so that this era is often referred to as the Allotment era ... Indian reservations were broken up and land was given to individual Indians, resulting in the loss of ... two thirds of the Indian land base.” (p. 5, 2010). Fouberg (p. 11, 2000) has similar sentiments: “With the weapons of “domestic dependency” and plenary power, and with the unilateral cessation of treaty-making, the next federal government policy did the most direct damage to tribal territorial sovereignty. As non-tribal settlers continued to move onto the Great Plains, the federal government passed the General Allotment Act in 1887.” Thus, the Allotment Act not only took lands, but by “encouraging” assimilation it thwarted court actions to reclaim indigenous lands.

transfers, and litigation continues to this day over their legitimacy. The allotment era was a low point in the respecting of tribal rights by the federal government, even as laid out in *Worcester*, and ended in 1934 with the passage of the Indian Reorganization Act.

Once a reservation was selected for allotment, all tribal members on that reservation were given allotments. Often, this process did not exhaust the supply of available land on a reservation. When this occurred, excess lands left over were declared “surplus” and were then taken and made available for white settlement. In most cases, these lands were removed from the reservation and governance of the tribe (Leonard, Parker, and Anderson, 2020). In total, through the various allotment acts between 90–100 million acres of previously recognized indigenous lands (amounting to 2/3s of the tribal land base) were removed from reservations (Wall, p. 6, 2010; Ball, p. 21, 2016).

The specific terms under which surplus lands were made available to whites provide strong institutional support for our hypothesis. By law, surplus lands under the Dawes Act were to be sold until the revenues provided enough compensation to the tribes as laid out in the relevant legislation, precluding the use of homesteading to settle these lands. However, lands sold under the Dawes Act required the same *occupancy* restrictions as homesteads (Edwards *et al.*, p. 118, 2017). The fact that lands sold within the areas taken under the Dawes Act had homestead occupancy restrictions supports our hypothesis. The lands had to be sold to pay the tribes, but occupancy was *intentionally* added to mimic the one feature of homesteading that the state had maintained throughout the late homesteading era. The advantage for the government was that subsequent legal challenges to allotment would be less likely to result in tribal repossession of land.

5. Quantitative Evidence for the Late Homesteading Hypothesis

5.1. Identifying Taken Lands

Whether through negotiated treaties that were not fully understood, renegotiations under different threat points, or outright takings, the nineteenth and early twentieth century saw the dispossession of vast amounts of indigenous land. To test a theory of late

homesteading based on indigenous land dispossession, however, an operational notion of “land taking” must be used.²⁹ Our major historical source for this measure comes from the 1899 compilation of indigenous land cessions created by Charles Royce (Royce, 1899) to determine which lands were ceded through something like a voluntary exchange, and which lands were taken using either illegal, illegitimate, or otherwise legally questionable means.³⁰

The massive Royce reference not only lists the dates, legal reference, and descriptions of the over 700 land cessions, but tracks the evolution of land cessions as they were modified over time. Most importantly, Royce often provides historical remarks that fill in context and details missing from the technical descriptions of the cessions. In these comments one is struck by how often something like the following remark occurs:

No treaty was ever made with these Indians for the extinguishment of their territorial rights. The U.S. simply took possession of their country, except such portions as have been set apart by executive order for their occupancy.

Royce, p. 857, 1899, in reference to Cession #532]

We use this textual information, along with various histories, to classify particular land cessions as either (legitimately) “ceded” or “taken.” Although *all* Western lands were ultimately taken from tribes in one way or another, our interest is in distinguishing takings that were particularly subject to redress under U.S. law. We define a land cession as “ceded” if there is evidence it was voluntarily entered into by each side. That is, if there is evidence in the historical record of i) an actual exchange of lands for some type of consideration, ii) no indication of duress or *ex post* unilateral change of terms, and iii) no evidence of outright opposition to the cession.

²⁹ As noted above, courts have struggled with this issue as well. As laid out in *Solem* (1984) Congress has the right to “take” indigenous lands, but must expressly do so. Determining this intent involves “surrounding circumstances,” “unequivocal evidence,” and the understanding of members and nonmembers of the reserve. Our definition of taken lands is more general in that, even if Congress had explicitly stated an intent to take a given territory, we would consider it “taken” if it was involuntary on the part of the tribe.

³⁰ Fortunately, the maps compiled by Royce have been scanned, geo-referenced, and digitized by the U.S. Forest Service. The mapped cessions are linked to the Royce report and the relevant treaties; they show the cession number, location, and date of each land cession, along with the relevant law or executive order that governed it, and the names of the tribes involved. Available at: <https://www.arcgis.com/apps/webappviewer/index.html?id73bc34f3a32>

On the other hand, we define a land cession as “taken” if i) there is evidence of a unilateral action by the federal government, ii) there is no evidence of consideration, iii) the treaty was not ratified but the lands were taken anyway, and iv) if there was open opposition by the tribes involved with the cession. We relied heavily on the comments in the Royce report. In that report Royce describes many cessions as “taken possession of without formal purchase” (p. 831); “no formal purchase, treaty not ratified” (p. 825); “Country claimed by ... was taken possession of by settlers ... without purchase of title by the U.S.” (p. 836); “U.S. took possession ... without any treaty” (p. 869). Many of the executive orders simply placed indigenous lands into the public domain without any compensation. Finally, many land cessions went through a series of revisions which continuously reduced tribal lands with no indication of compensation. In all of these cases we classified these lands as “taken,” as opposed to “ceded.” These takings are cases where future legal claims could potentially overturn the federal government’s actions.³¹

Figure 3 depicts the borders of the various land Cessions from Royce (1899) along with our coding of which cessions were “taken.” The map shows that some cessions were enormous in size, while others were quite small. In total, there were around 700 cessions in the U.S., with about 400 taking place in the West. Comparison to Figure 2 suggests a high degree of overlap between taken lands and areas where late homesteading was especially prevalent.

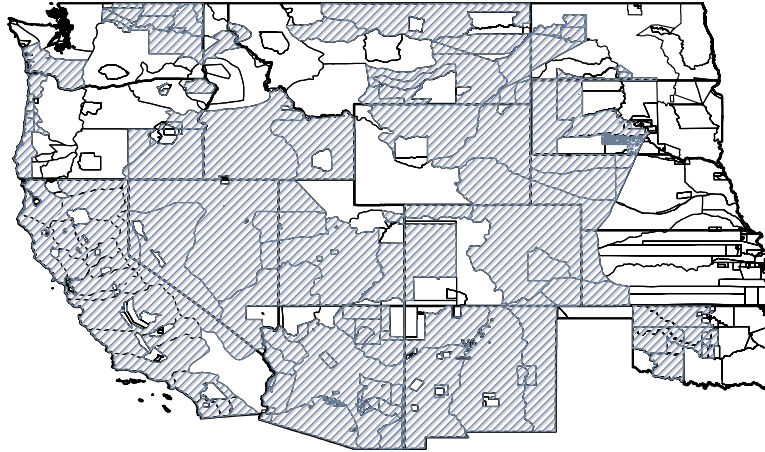
5.2. Land Patent Data

Our data on homesteading and cash sales come from the digitized federal land patents originally issued by the General Land Office (GLO), and currently available through the Bureau of Land Management, Eastern States Office (BLM).³² In addition to the issue date

³¹ Not all land cessions were capable of being assigned into one of these two categories because Royce provided no information. Furthermore, not all lands in the western U.S. are contained within the Royce maps, either because there never was a treaty covering them, or cession took place later. This means that within our data, there are plots of land that cannot be assigned to a cession, or if assigned, cannot be categorized as taken or ceded.

³² A given land patent can be simple and involve one person and one plot of land; they can also be complicated and involve many people and plots. Here we treat each separate land plot as an observation.

Figure 3 Land Cessions and Lands Taken



Notes: Lines show Cession borders, shaded areas the Cessions taken, based on Royce (1899).

and the type of land claim, the BLM data report various characteristics of the patents themselves.³³ These include whether they convey subsurface rights, how many separate individuals are associated with the patent, and whether the patent was associated with an irregular “metes and bounds” survey.

Each patent is geographically identified through its Public Land Survey System (PLSS) identifier, which is made up of an aliquot part, section, township, and range numbers.³⁴ Within each township there are 36 square-mile (640-acre) “sections” numbered 1 through 36. A given section can be further subdivided, and this division is called the “aliquot part.” The first subdivision is into quarter-sections (160 acres), and these are identified

There are hundreds of patent entry types, but this paper only deals with homesteads and cash sales. Among the homesteads, there are also many types: original homesteads, filed under the 1862 Homestead Act, stock raising, timber, forest, reclamation, enlarged, and desert homesteads. Generally speaking we aggregate all of the homestead types. The data is available at <http://www.glorerecords.blm.gov/BulkData/default.aspt>.

³³ Following Allen and Leonard 2021, we assume that the arrival date for homesteads is five years prior to the patent signature date because homesteaders had to occupy their claim for five years prior to perfecting title.

³⁴ The federal land states are divided into “regional districts” that have a single reference baseline (latitude) and principal meridian (longitude) within them. Within each regional district there are “townships:” a 36 square mile area referenced by the baseline and principal meridian. For example, a township might be 8 North 3 East, which means it is in the eighth tier of townships north of the baseline, and in the third column of townships east of the reference meridian.

by “NW,” “NE,” “SW,” or “SE.”³⁵

The federal government publishes shapefiles of the PLSS for every federal land state to the section level, and we identify all of our patents to this level. In other words, we locate every homestead and cash sale patented issued over 1860 — 1940 to within a square mile. We overlay the section grid with the land cessions to determine what land cession and treaty lies behind every land patent. This allows us to link lands taken or ceded with each land patent according to the coding of indigenous lands from Royce (1899).

We also calculate a variety of geographic characteristics associated with each square-mile PLSS section. Elevation data from the National Elevation Dataset (NED, 30-by-30 meter) is used to calculate the mean and standard deviation of elevation, utilizing the latter as the measure of ruggedness (following Ascione, *et al.* (2008), Allen and Leonard (2021)). Average soil quality for each plot is measured using the soil productivity index (PI) grid developed by Schaetzl, *et al.*, (2012). The distance from each plot to the nearest perennial stream and railroad are calculated based on the National Hydrography Dataset and Atack’s (2016) railroad shapefile.

5.3. Motivating Example: Montana

Montana — the state with the most late homesteading — provides an illustrative example for motivating our empirical tests. The eastern portion of the state is part of the Great Plains, and was home to some of the most significant battles and participants in the Indian Wars (Crazy Horse, Sitting Bull, Custer, Chief Joseph, etc.). These tribes had nomadic lifestyles that revolved around the bison, and these tribes entered the 1851 Fort Laramie Treaty. The western, mountainous, part of the state was originally part of the Oregon Territory, and until 1846 was jointly managed with the British. Tribes in the west were not nomadic, and entered a separate treaty process in 1855. Generally speaking, the mountainous tribes ceded their lands, and the lands on the Plains were taken.

³⁵ As lands get further subdivided, the aliquot parts become more complicated. For example, one of our GLO patents plots has the PLSS identifier of N $\frac{1}{2}$ NE 27 T57N R87W. This would read: the north half of the northeast quarter of section twenty-seven in township fifty-seven north of range eight-seven west.

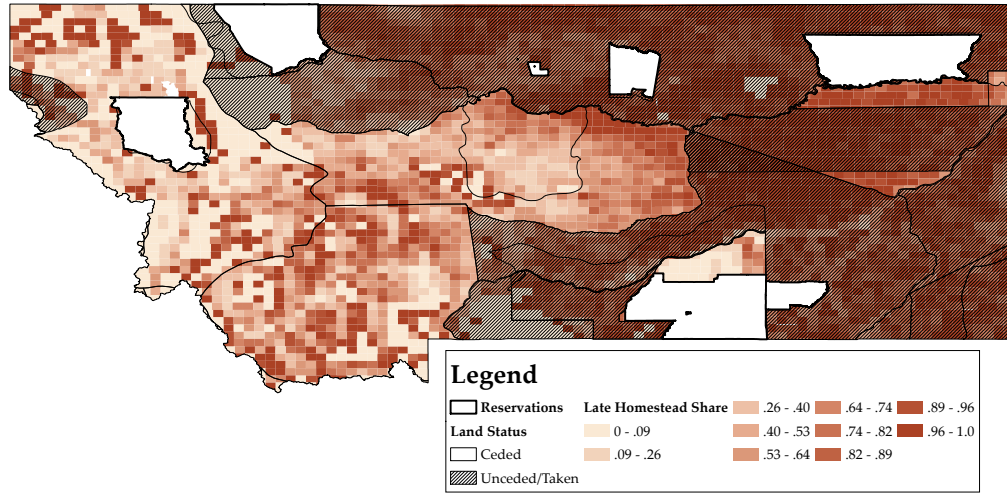
As noted, the initial 1851 land allocation was enormous. Consider the Crow Nation whose original territory spanned parts of Wyoming and Montana. Appendix Figure A2 shows the Crow territory as described in the 1851 Treaty which included 38 million acres. Over time, as federal Indian policy changed, the Crow territories were reduced. In 1868 the second Fort Laramie Treaty reduced Crow lands to 8 million acres. In 1882 an act of Congress reduced the lands again, and granted some of the lands to the Northern Pacific Railroad. In 1891 there was another 2 million acre reduction, and in 1904 the Crow reservation was diminished to its present size of 2.3 million acres.

This process of reduced territorial lands occurred for the other eastern and northern Montana tribes. The Blackfeet controlled most of the North-Central area of the state, but after the initial 1851 treaty had lands taken back in 1855, 1873, 1874, 1896, 1907, 1908, and finally 1911. Likewise for the other major eastern tribes in the state, each went through a series of land reductions by executive order and federal legislation from *c.* 1855-*c.* 1910.³⁶ In contrast, the western tribes, did not experience the same degree of reductions in lands, and ended up with fewer lands taken. Hence, Montana has a mix of lands that were formally ceded to the U.S. and other lands that were taken, and hence subject to a court challenge.

Of all the homesteading in Montana, 98% was late homesteading. In order to get a sense of late homesteading intensity across the state, consider the amount of late homesteading within a given area relative to the total amount of homesteading and cash sales within the same area after 1895. Figure 4 shows the land cession areas we define as taken (shaded) based on Royce (1899) overlaid with intensity of late homesteading within each PLSS township (darker areas meaning more intensive homesteading; the white area are reservations). Visually it is clear that most of the taken lands were in the eastern portion of the state, and this is also where the most intensive late homesteading was. Our empirical analysis is designed to formally test for the effect of taken lands on the prevalence of land homesteading.

³⁶ The Cree ended up with no lands, and efforts were made to deport them to Canada. In 1916 a small reserve was established for the “homeless and wandering Indians.”

Figure 4: Taken Lands and Homestead Intensity in Montana



Notes: This figure depicts the intensity of late homesteading in each 6×6-mile Public Land Survey System (PLSS) township in Montana, along with ceded vs. taken indigenous lands. We define the share of late homesteads as $\text{Late Share} = (\text{Late Homesteads}) / (\text{All Homesteads} + \text{All Cash Sales})$, where a homestead is considered “late” if it has an arrival date after 1895. See section 4.1 for details on the our coding of ceded vs. taken lands and Section 4.2 for details on the land patent data used to create this figure.

5.4. Empirical Strategy

Our primary goal is to test the hypothesis that late homesteading is more likely to occur on taken tribal lands that were taken by the U.S. government. To do this, we construct three different comparisons: i) homesteads vs. cash sales after 1895 (late homesteads vs. late cash sales), ii) homesteads after 1895 vs. homesteads before 1895 (late homesteads vs. early homesteads), and iii) homesteads after 1895 vs. homesteads before 1895 *and* all cash claims (late homesteads vs. all other claims).³⁷ The first comparison corresponds directly our main prediction — that after 1895 there is an added incentive to allow homesteading on

³⁷ The “break” for where to define late homesteading is not set in stone. On the one hand, one could argue that the General Allotment Act of 1887 should be the starting date. But this was only the first of a series of legislation that both allowed for indigenous land confiscation and/or refined homestead laws. These laws would continue to be created into the 1910s. On the other hand, empirically the bulk of late homesteading didn’t start until about 1910. Alternatively, historians define the break in the early 1890s. We’ve chosen 1895 as a compromise; however, it makes almost no difference to the results if late homesteads are defined as starting in any year between 1890–1900.

taken lands. The second comparison follows from the fact that the incentive to promote homesteading was not unique to taken lands prior to the 1890s because the U.S. claim to *de facto* sovereignty was tenuous across most of the frontier (Allen, 1991). The final comparison also follows from the theory. Individuals are likely unwilling to spend cash for lands that have insecure titles.

For all three comparisons, we estimate a model of the form:

$$1(LateHomestead)_i = \beta_0 + \beta_1 1(Taken)_i + \lambda \vec{X}_i + \varepsilon_i \quad (1)$$

where $1(LateHomestead)_i$ is an indicator that is equal to 1 if a plot of land was homesteaded after 1895, and zero otherwise and $1(Taken)_i$ is an indicator equal to 1 if a plot of land falls within a taken territory that was taken by the federal government. $\vec{X}_i$ is a vector of control variables and ε_i is a random error term.

Identification of β_1 is primarily threatened by two factors. First, unobserved determinants of land takings may be correlated with homesteading. I.e., land characteristics that led to land being taken may also make the land more likely to be homesteaded. Previous studies have found that treaty relations between the US government and tribes were primarily driven by relative military capacity (Spirling, 2011; Anderson and McChesney, 1994), and not agricultural viability, suggesting that “taken” territories are not selected on land characteristics. Still, we control flexibly for a variety of geographic characteristics to limit the possibility of omitted variable bias. Moreover, our comparisons of late homesteads to late cash sales are less likely to suffer from this problem, as cash sales and homesteads tended to have similar characteristics within states (Allen and Leonard, 2021).

The second threat to identification is reverse causality. Our interpretation of β_1 would be compromised if late homesteaders encroached on tribal lands, prompting the government to take those lands rather than pursue treaties. Two facts make this unlikely. First, the federal government had actively sought out to renegotiate treaties in the 1870s and 1880s, ahead of late homesteading. Second, the timing is wrong. Most land takings occurred prior to 1895, ruling out reverse causality.

Table 2 reports the results of estimating equation 1 using a variety of specifications across the three different samples mentioned above. Column 1 includes state fixed effects but no controls. Column 2 adds linear controls for ruggedness, elevation, soil quality, distance to the nearest stream, distance to the nearest railroad, and the latitude and longitude of each plot’s centroid. Column 3 adds controls for the number of individuals associated a patent and indicators for whether a patent included subsurface rights or was surveyed via metes and bounds. Column 4 uses semi-parametric, binned land quality controls by including indicator variables for each decile of each land quality variable (excluding the coordinate controls, which are still included linearly). Column 5 adds dummy variables for distance to the nearest reservation, in 50-mile increments from 0 to 200. Column 6 excludes plots associated with lands that were taken after 1895. We cluster standard errors by county in all cases.

In Panel A of Table 2, the sample is restricted to homesteads and cash sales with an arrival date after 1895, so the comparison is between late cash sales and late homesteads. Across all six specifications, taken territories are associated with a statistically significant increase in the probability that a plot settled after 1895 was homesteaded rather than purchased. The coefficient estimates range from 0.045 to 0.1. Adding additional controls reduces the magnitude of the coefficient somewhat. In our preferred specification in column 6, taken lands are associated with a 8.4 percentage point increase in the probability that a plot was homesteaded — a 10.7% increase relative to the baseline probability of 77.9%.

Panel B of Table 2 compares late homesteads to early homesteads, restricting the sample to only include homesteaded plots. Across all specifications, taken territory is associated with a statistically significant increase in the probability that a plot was homesteaded late, rather than early. Our preferred estimates in column 6 indicate that plots in taken territory prior to 1895 were $.210/0.684 = 30.7\%$ more likely to be homesteaded late, rather than prior to 1895. Finally, Panel C compares late homesteads to all other claims in the sample: homesteads settled before 1895 *and* all cash sales. Once again, the impact of taken territory is positive and significant in all specifications. Hence, plots in taken territory were more likely to be late homesteads compared to any other type of claim

Table 2: The Probability of Homesteading on Ceded vs. Taken Land

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Homesteads vs. Sales After 1895</i>						
	$y = 1(\text{Homestead})$					
$1(\text{Unceded Territory})$	0.100*** (0.0249)	0.0785*** (0.0261)	0.0527** (0.0257)	0.0448* (0.0250)	0.0453* (0.0246)	0.0839*** (0.0253)
Adjusted R-squared	0.116	0.132	0.176	0.184	0.189	0.154
Observations	2,070,715	1,818,802	1,790,374	1,790,374	1,790,374	1,169,872
Mean Dep. Var.	0.767	0.758	0.759	0.759	0.759	0.779
<i>Panel B: Late vs. Early Homesteads</i>						
	$y = 1(\text{Arrival Date} > 1895)$					
$1(\text{Unceded Territory})$	0.353*** (0.0332)	0.328*** (0.0231)	0.316*** (0.0231)	0.265*** (0.0242)	0.264*** (0.0243)	0.210*** (0.0250)
Adjusted R-squared	0.310	0.359	0.381	0.400	0.401	0.395
Observations	2,085,647	1,861,225	1,836,235	1,836,235	1,836,235	1,360,204
Mean Dep. Var.	0.773	0.752	0.752	0.752	0.752	0.684
<i>Panel C: Late Homesteads vs. All Other Claims</i>						
	$y = 1(\text{Homestead}) \times 1(\text{Arrival Date} > 1895)$					
$1(\text{Unceded Territory})$	0.276*** (0.0253)	0.252*** (0.0239)	0.219*** (0.0222)	0.189*** (0.0235)	0.186*** (0.0234)	0.185*** (0.0245)
Adjusted R-squared	0.263	0.281	0.339	0.348	0.350	0.353
Observations	3,137,442	2,859,964	2,822,105	2,822,105	2,822,105	2,131,184
Mean Dep. Var.	0.514	0.490	0.489	0.489	0.489	0.436
N Fixed Effects	14	14	13	62	62	61
Land Quality Controls	<i>none</i>	<i>linear</i>	<i>linear</i>	<i>binned</i>	<i>binned</i>	<i>binned</i>
State FE	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Patent Controls	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Reservation Distance Bins	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
Early Takings Only	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>

Notes: Results of estimating equation 1. Land quality controls include elevation, ruggedness, soil quality, distance to nearest stream, distance to railroad, and the latitude and longitude of a section's centroid (the latter is included linearly in specifications where we bin the other land quality controls. Patent controls include the number of names associated with patent and indicator variables for whether a patent included mineral rights and whether it was part of an irregular survey. Early takings are those that occur before 1895. The sample in Panel A includes only homesteads and cash sales after 1895. The sample in Panel B includes only homesteads. The sample in Panel C includes all homesteads and cash sales. Standard errors are clustered by county and reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

in the sample. The column 6 estimates imply that taken plots were $0.185/0.436 = 42.4\%$

more likely to be late homesteads.

There are a number of cessions which are difficult to definitively classify as ceded via treaty or taken. Our main results in Table 2 omit these ambiguous cessions and focus only on clear cases. Table A3 in the appendix includes all cessions and adds an indicator, $1(Ceded)_i$ for plots on lands that were clearly ceded via treaty. The omitted category in these regressions includes all plots that could not be clearly assigned to the Ceded or Taken groups. Across all six specifications in all three panels, the results are qualitatively unchanged from Table 2: the coefficient on *Taken* is smaller in some cases, but remains statistically significant and of similar magnitude relative to the mean of the dependent variable. The coefficient estimates for *Ceded* in Panel B indicate that plots on ceded lands were less likely to be homesteaded after 1895 than before, and the estimates in Panel C indicate that plots on Ceded lands were overall less likely to be late homesteads than any other type of plot.

6. Alternative Hypotheses

Here we examine some potential alternative explanations for why the U.S. government intentionally continued the practice of homesteading through the early 20th century. One explanation centers on the “safety valve” hypothesis that westward expansion helped the United States absorb major waves of immigrants arriving during the late nineteenth and early twentieth centuries (Turner, 1893; Ferrie, 1997). Another potential explanation is that late homesteading was used as a way to incentivize settlement in coordination with new irrigation projects being developed by the Bureau of Reclamation, which was established in 1902. We assess the evidence for each in turn.

6.1. Late Homesteading as a Safety Valve?

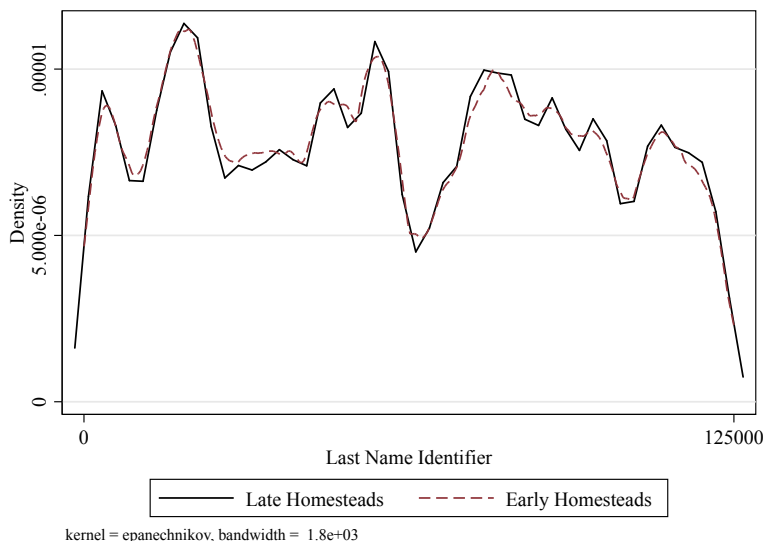
Late homesteading could have been a social safety-valve to take care of the massive wave of immigration that took place at the turn of the twentieth century. In 1920, close to fourteen million Americans were immigrants. It is possible that homesteading was

used as a way to reduce the costs of moving into eastern settled states for large waves of immigrants.

Unlike earlier waves, immigration at the turn of the twentieth century mostly included people from southern and eastern Europe. Thus, if late homesteading was the result of immigration pressures, the homesteaders should have been made up of people from these regions. One method to test for a difference is to simply look at the distribution of homesteader names before and after 1895, as reported in the GLO land patent data.

Figure 5 provides evidence that suggests there was little difference in surnames over time by comparing two density functions of the prevalence of last names for early and late homesteaders. For each sample, every unique name was assigned a number (e.g., “Smith=7”) and then the densities of these numbers were plotted. There is no statistical difference in the distribution of names across the two periods. The probability of being a “Smith” is the same between the two.

Figure 5: Density of Unique Surnames



Notes: Figure depicts density of unique last names for late homesteads (solid black line) vs. early homesteads (dashed red line).

We utilize county-level census data to provide a more formal test of immigration as a rationale for late homesteading. The U.S. Census reports the total population as well as

the “foreign-born” population for each county in every decade. We assemble a panel from 1870 to 1920 and calculate the change in the foreign-born population as a share of the total change in the population in each county in each decade. This allows us to characterize the intensity of immigration at the county level, which we can then match with plots settled in each county in each decade. If homesteading was a mechanism for absorbing waves of immigration, then late homesteads should be more likely than cash sales over the period 1895 to 1920 in counties where a larger share of the change in population is attributable to foreign-born individuals.

Panel A of Table 3 formally tests the immigration channel by regressing the late homestead indicator on the foreign share of county population change associated with the county and decade corresponding to the time and place a given plot was settled. The sample is homesteads and cash sales after 1895 only. The specifications mimic those found in columns 1-5 of Table 1. In column 6, we add the *Taken* indicator to test whether the relationship between taken lands and late homesteading remains after controlling for foreign immigration. In all specifications, late homesteads are not more likely in counties with a larger share of foreign immigration in any given decade. Moreover, controlling for immigration actually increases the strength of the relationship between taken lands and homesteading in column 6 (compare to column 5 of Table 2).

6.2. Reclamation and Homesteading

Congress created the Bureau of Reclamation (BOR) with the passage of the Reclamation Act in 1902. Although much of the irrigation development that occurred in the nineteenth century was privately funded (Leonard and Libecap, 2019), it was generally not profitable for private enterprises to undertake the massive engineering feats required to build large-scale storage and conveyance infrastructure. As with many other large infrastructure projects, the federal government was best suited to absorb the magnitude of the fixed costs involved, especially given the long time horizon over which benefits would materialize (Coman, 1911).

Under the 1902 Act, the primary means for the BOR to recoup its costs was through charges for water deliveries. To have any hope of solvency, a project needed farmers

Table 3: Alternative Explanations for Late Homesteading

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Immigration Safety Valve Hypothesis</i>						
	<i>y = 1(Homestead)</i>					
Foreign Share of County Population Change	0.00564 (0.00580)	0.00226 (0.00445)	0.00172 (0.00306)	0.00159 (0.00309)	0.00220 (0.00296)	0.00202 (0.00301)
<i>1(Unceded Territory)</i>						0.0805** (0.0315)
Adjusted R-squared	0.100	0.119	0.187	0.199	0.207	0.210
Observations	976,797	883,571	861,745	861,745	861,745	861,745
Mean Dep. Var.	0.761	0.750	0.752	0.752	0.752	0.752
<i>Panel B: Federal Irrigation Projects</i>						
	<i>y = 1(Homestead)</i>					
1000s of BOR Irrigated Acres in County (1910)	0.00211 (0.00444)	0.00324 (0.00357)	0.00233 (0.00455)	0.00215 (0.00402)	0.00390 (0.00383)	0.00329 (0.00396)
<i>1(Unceded Territory)</i>						0.0841*** (0.0309)
Adjusted R-squared	0.060	0.091	0.148	0.162	0.168	0.170
Observations	1,020,952	931,593	904,658	904,658	904,658	904,658
Mean Dep. Var.	0.752	0.744	0.746	0.746	0.746	0.746
<i>Panel C: Both</i>						
	<i>y = 1(Homestead)</i>					
Foreign Share of County Population Change	0.00695 (0.00590)	0.00386 (0.00467)	0.00276 (0.00317)	0.00264 (0.00320)	0.00332 (0.00311)	0.00318 (0.00313)
1000s of BOR Irrigated Acres in County (1910)	0.00241 (0.00422)	0.00258 (0.00339)	0.000796 (0.00415)	0.000872 (0.00379)	0.00246 (0.00352)	0.00217 (0.00363)
<i>1(Unceded Territory)</i>						0.0556* (0.0299)
Adjusted R-squared	0.054	0.087	0.153	0.162	0.167	0.168
Observations	855,693	774,066	752,929	752,929	752,929	752,929
Mean Dep. Var.	0.780	0.772	0.775	0.775	0.775	0.775
N Fixed Effects	13	13	12	60	58	58
Land Quality Controls	<i>none</i>	<i>linear</i>	<i>linear</i>	<i>binned</i>	<i>binned</i>	<i>binned</i>
State FE	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Patent Controls	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Reservation Distance Bins	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>

Notes: This table presents the results of tests for alternative mechanisms. The specifications mimic those in the first five columns of Table 2. In all cases, the sample consists of homesteads and cash sales after 1895. Individual patents are matched to county-level data based on the location of the patent and the arrival date. Standard errors are clustered by county and reported in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

working the land and paying for water. This, coupled with the desire to avoid speculation on future irrigated lands, led Congress to restrict settlement of BOR lands to homestead entries only (Coman, 1911). It may be that late homesteading was primarily an attempt to ensure a reliable and early demand for the irrigation water that Congress was paying

to supply.

To test whether late homesteads are systematically related to federal irrigation projects, we use data from the 1910 Census of Agriculture, which reports the number of acres irrigated by BOR projects in each county. This figure was not reported regularly or systematically across censuses, so we focus on cross-sectional variation in BOR acreage. We think this test is sufficient because if the primary motivation for allowing homesteading was to settle lands serviced by the BOR, it seems unlikely that the government would have allowed homesteading to continue through the 1930s if no relationship between homesteading and BOR lands had emerged by 1910.

In Panel B of Table 3, we regress the late homestead indicator on BOR acreage in a county. As with immigration, the specifications mimic those in Table 2, and column 6 reintroduces the *Taken* indicator. Across all specifications, the relationship between BOR acreage in a county in 1910 and the probability that a post-1895 plot was homesteaded rather than bought is small and statistically insignificant.³⁸ Column 6 indicates that controlling for BOR acreage does not impact the relationship between taken lands and homesteading.

In Panel C, we include both potential mechanisms, following the same set of specifications and restricting the sample to plots settled after 1895, as in Panels A and B. Once again, there is no detectable relationship between late homestead and either immigration or BOR acreage, while the *Taken* coefficient survives the inclusion of both measures. The *Taken* coefficient is smaller in Panel C than in Panels A and B, and it is marginally significant, but this is primarily driven by changes in the sample associated with imperfect matches between the modern county boundaries reported in the patent data and the history boundaries in the Census data.³⁹

³⁸ It is important to note that many BOR-related homesteads likely failed because homesteaders lacked the (considerable) financial capital necessary to successfully engage in irrigated agriculture (Coman, 1911). In addition to the small number of homesteads made on BOR land, this may also explain why we fail to find a relationship between homesteading and BOR acreage, despite the homesteading requirement under the Reclamation Act.

³⁹ Appendix Table A4 re-estimates column 5 of Table 2 in each relevant sample while omitting the controls

7. Conclusion

The 1862 Homestead Act was used along with the various railroad land grant acts and the Land-Grant College Act (1862) to quickly settle parts of western territory that were claimed by the Confederacy and in the hands of Native tribes (Allen 1991, 2019). During the early period of homesteading large tribal territories were established, and homesteading (along with forced movement) was used to push tribes into these areas. By 1890 the entirety of U.S. policy to exercise sovereignty over the west had been successful. Railroad land grants ended, and the federal government pulled back the reins of transferring lands to private interests during the Progressive era. All land policy made an about-face and headed in the same direction. Except for homesteading.

Homesteading was perhaps the most costly of all nineteenth century land policies. Allocating lands based on first possession created race incentives that partly dissipated the value of lands (Anderson and Hill, 1990). Furthermore, early homesteaders occupied and developed lands that got in the way of commercial activity, leading to a path dependency of lower development compared to lands not homesteaded that has lasted until this day (Allen and Leonard, 2021). Had homesteading simply been bureaucratically entrenched, with an inertia that allowed for continued but fading amounts of homesteading, there would be little to explain. But this was not so. Homesteading exploded after 1895 and was continually and intentionally revised by Congress.

We claim that the value of homesteading to the federal government came from one key feature: homesteaders had to live on the land. When land is occupied, homes and barns are built, roads and stores arise, a certain type of development takes place, and eventually population growth and cities make “going back” impossible. In the words of Justice Ginsburg, this would “... preclude the Tribe from rekindling embers of sovereignty that long ago grew cold.”⁴⁰

for immigration and BOR acres and confirms that the shifts in the coefficients are due almost entirely to changes in the sample.

⁴⁰ *City of Sherrill v. Oneida Indian Nation*, 544 U.S. at 214 (2005). The Oneida tribe had repurchased lands long ceded and then attempted to exert sovereignty by claiming exemption from property tax on commercial buildings.

The Indian treaties of the mid-nineteenth century reflected the relative strength of western tribes at that time, and thus created a time consistency problem for the U.S. later in the century. The plenary power of the state allowed it to ultimately take most of the lands it had recognized as belong to tribes in the treaties of mid-nineteenth century, and late homesteading prevented the land from ever going back into tribal hands — even if the federal government’s actions were later ruled illegal. Consistent with this, we find that the location of late homesteading is well explained by the legal standing of the final land cessions that transferred indigenous lands to the federal government. When those land cessions were more legally dubious, late homesteading took place. Late homesteading, therefore, was a major policy tool in the dispossession of indigenous lands during the early twentieth century. The large amount of late homesteading was a consequence of the enormous land transfer that took place after 1890 as a result of the Dawes Acts.

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Appendix

Data Sources

The federal land patent data is from [http://www.glorerecords.blm.gov/BulkData/ default.aspx](http://www.glorerecords.blm.gov/BulkData/default.aspx).

Railroad files used for distances were created by Jeremy Attack, and located at: <https://my.vanderbilt.edu/downloads/>.

The elevation data is from: <https://datagateway.nrcs.usda.gov/>, and the soil quality data is from: <http://www.geographer-miller.com/productivity-index-grid/>.

Table A1: Definitions of Variables

Variable

Homestead	= 1 if land was homesteaded, 0 otherwise.
Late Homestead	= 1 if homestead was after 1895.
Land Taken	= 1 if land cession was deemed legally contestable.
Land Ceded	= 1 if land cession was deemed voluntary.
Late Cession	= 1 if land cession was after 1880.
Early Cession	= 1 if land cession was before 1880.
Latitude	= The decimal degrees of latitude for the center of a land plot.
Longitude	= The absolute value of the decimal degrees of longitude for the center of a land plot.
Water	
Distance	= Shortest distance in miles between the center of a land plot and major stream
Soil Quality	= Index variable that ranges from 0 to 19 measuring agricultural soil quality.
Land Ruggedness	= The standard deviation of elevation within a given section.
Metes	= 1 if land was surveyed by metes and bounds.
Subsurface	= 1 if mineral rights were reserved by the federal government.
People	= the number of individuals registered on the land patent.
Bins: 1-6	= distance bins in 50 mile increments, between land plot and nearest reservation.

Table A2: Summary Statistics

Homestead Sample: 1862–1940

Variable	Mean	Max	Min
Homestead	1	1	0
Late Homestead	0.74	1	0
Land Taken	0.63	1	0
Land Ceded	0.24	1	0
Late Cession	0.21	1	0
Early Cession	0.72	1	0
Water			
Distance (miles)	4.48	121.5	0
Soil Quality	10.3	19	0
Land Ruggedness	16.8	680	0
Metes	0.003	1	0
Subsurface	0.20	1	0
People	1.06	37	1

Table A3: Alternative Coding of Ceded vs. Taken Lands

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Homesteads vs. Sales After 1895</i>						
	$y = 1(\text{Homestead})$					
$1(\text{Unceded Territory})$	0.113*** (0.0254)	0.100*** (0.0243)	0.0730*** (0.0226)	0.0759*** (0.0214)	0.0668*** (0.0221)	0.0637*** (0.0213)
$1(\text{Ceded Territory})$	0.0175 (0.0295)	0.0311 (0.0297)	0.0281 (0.0275)	0.0271 (0.0264)	0.0180 (0.0265)	-0.0202 (0.0267)
Adjusted R-squared	0.113	0.129	0.176	0.183	0.187	0.152
Observations	2,382,954	2,161,373	2,13,2573	2,132,573	2,132,573	1,353,979
Mean Dep. Var.	0.741	0.728	0.729	0.729	0.729	0.762
<i>Panel B: Late vs. Early Homesteads</i>						
	$y = 1(\text{Arrival Date} > 1895)$					
$1(\text{Unceded Territory})$	0.0777*** (0.0201)	0.0569*** (0.0194)	0.0435** (0.0185)	0.0359** (0.0176)	0.0580*** (0.0167)	0.0805*** (0.0211)
$1(\text{Ceded Territory})$	-0.281*** (0.0330)	-0.284*** (0.0280)	-0.286*** (0.0268)	-0.245*** (0.0268)	-0.220*** (0.0246)	-0.135*** (0.0296)
Adjusted R-squared	0.294	0.334	0.358	0.378	0.383	0.383
Observations	2,335,170	2,133,450	2,108,246	2,108,246	2,108,246	1,534,157
Mean Dep. Var.	0.768	0.750	0.750	0.750	0.750	0.686
<i>Panel C: Late Homesteads vs. All Other Claims</i>						
	$y = 1(\text{Homestead}) \times 1(\text{Arrival Date} > 1895)$					
$1(\text{Unceded Territory})$	0.134*** (0.0212)	0.121*** (0.0205)	0.0904*** (0.0187)	0.0910*** (0.0183)	0.0935*** (0.0183)	0.107*** (0.0187)
$1(\text{Ceded Territory})$	-0.145*** (0.0272)	-0.144*** (0.0263)	-0.144*** (0.0233)	-0.123*** (0.0234)	-0.117*** (0.0221)	-0.0827*** (0.0274)
Adjusted R-squared	0.241	0.251	0.314	0.321	0.324	0.337
Observations	3,628,429	3,386,547	3,348,124	3,348,124	3,348,124	2,451,335
Mean Dep. Var.	0.494	0.472	0.472	0.472	0.472	0.429
N Fixed Effects	13	13	12	61	61	61
Land Quality Controls	<i>none</i>	<i>linear</i>	<i>linear</i>	<i>binned</i>	<i>binned</i>	<i>binned</i>
State FE	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Patent Controls	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>yes</i>
Reservation Distance Bins	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>	<i>yes</i>
Early Takings Only	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>no</i>	<i>yes</i>

Notes: This table depicts the results of estimating equation 1 in an expanded sample that includes land losses that could not be cleanly identified as ceded or taken. These unidentified land losses form the omitted category in this table. Land quality controls include elevation, ruggedness, soil quality, distance to nearest stream, distance to railroad, and the latitude and longitude of a section's centroid (the latter is included linearly in specifications where we bin the other land quality controls. Patent controls include the number of names associated with patent and indicator variables for whether a patent included mineral rights and whether it was part of an irregular survey. Early takings are those that occur before 1895. The sample in Panel A includes

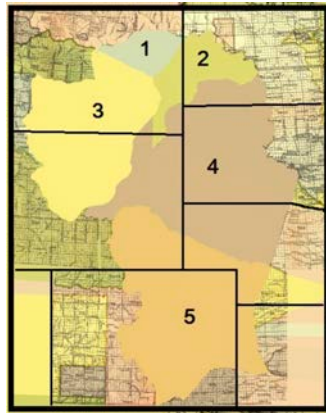
only homesteads and cash sales after 1895. The sample in Panel B includes only homesteads. The sample in Panel C includes all homesteads and cash sales. Standard errors are clustered by county and reported in parentheses.

Table A4: Impact of Sample Restrictions on Coefficient Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
			$y = 1(\text{Homestead})$			
$1(\text{Unceded Territory})$	0.0807** (0.0315)	0.0862*** (0.0310)	0.0570* (0.0298)	0.0713*** (0.0206)	0.0824*** (0.0193)	0.0898*** (0.0204)
$1(\text{Ceded Territory})$				-0.00637 (0.0310)	0.00855 (0.0344)	0.0414 (0.0332)
Adjusted R-squared	0.210	0.171	0.167	0.189	0.167	0.166
Observations	860,970	899,108	752,894	1,101,861	1,076,439	898,180
Mean Dep. Var.	0.752	0.746	0.775	0.719	0.726	0.753
N Fixed Effects	60	58	58	60	58	58
Omit Uncoded Claims	<i>yes</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>no</i>	<i>no</i>
Foreign Share Sample	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>yes</i>
BOR Sample	<i>no</i>	<i>yes</i>	<i>yes</i>	<i>no</i>	<i>yes</i>	<i>yes</i>

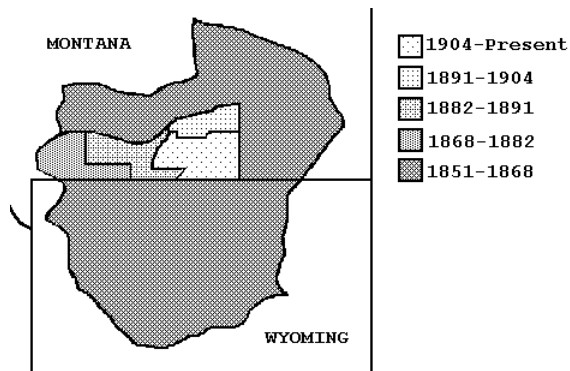
Notes: This table presents the results of estimating column 5 of Table 2 and Table A3 in the subsample of patents that can be matched to the county-level variables introduced in Table 3. Columns 1 through 3 reproduce the specification in column 5 of Table 1. Columns 4 through 6 reproduce the specification in column 5 of Table A3. Standard errors are clustered by county and reported in parentheses.

Figure A1: 1851 Fort Laramie Treaty Lands



Notes: The numbers on the map refer to lands given to specific tribes. Area 1: Assiniboine; 2: Arikara, Hidatsa and Mandan; 3: Crow; 4: Lakota; and 5: Arapaho and Cheyenne.

Figure A2: Crow Lands 1851–1904



Notes: This map is from “Apsáalooke Writing Tribal Histories Project” Chapter 6.1 Maps of the Apsáalooke.