
Legibility and External Investment: An Institutional Natural Experiment in Liberia

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Abstract We address a debate over the effects of private versus customary property rights on external investment. Despite political economists' claims that external investors favor private property rights, other experts argue that customary systems enable large-scale "land grabs." We organize these competing claims, highlighting trade-offs due to differences in legibility versus the ability to displace existing landholders under both systems. We study a natural experiment in Liberia, where law codifies parallel private and customary property rights systems. We use this institutional boundary and difference-in-differences methods to isolate differential changes in external investment under the different property rights systems following the global food crisis of 2007–08. We find a larger increase in land clearing where private property rights prevailed, with such clearing related to more concession activity. Qualitative study of a palm oil concession reveals challenges external investors confront when navigating customary systems.

The global food crisis that started in 2007 led to a spike in the demand for land in developing countries. By 2016, agricultural land acquisitions globally totaled over 40 million hectares (an area larger than Germany), and another 20 million hectares were covered by intended deals.¹

These trends have sparked debate about the institutions that attract external investment. Past work argues that foreign investors favor stable democracies that protect private property.² In their recent quantitative synthesis, Li, Owen, and Mitchell find that property rights mediate the relationship between democracy and foreign investment.³ The importance of private property is encoded in international indexes that rate the risk of expropriation (PRS Group) or "business freedom" (Heritage Foundation) across states.⁴ Yet, Deininger and Byerlee, echoing the concerns of many stakeholders in developing states, claim that the recent spate of deals—sometimes termed "land grabs"—follows a different logic.⁵ Investors focus attention on countries like Liberia, where they can negotiate with authorities to

1. Nolte, Chamberlain, and Giger 2016, vi.

2. Jensen 2008; Li and Resnick 2003.

3. Li, Owen, and Mitchell 2018.

4. For a recent review of foreign direct investment (FDI) determinants, see Pandya 2016.

5. Deininger and Byerlee 2011.

displace prior landholders and acquire large tracts at low prices.⁶ In this account, private property deters land investments, which get bogged down by protections that require consent from, and compensation for, existing landholders.

This debate in international political economy echoes a disagreement among anthropologists and political scientists about whether customary property rights deter investment. Customary property rights continue to govern huge swaths of land, covering two-thirds of Africa (roughly two billion hectares).⁷ On the one hand, these customary institutions can be more flexible: customary authorities can reallocate land without fearing legal challenges from individual titleholders.⁸ By this same logic, customary authorities can displace local landholders to free up tracts for new commercial investment.⁹ In case studies of thirty-eight agribusiness investments across four African states, Schoneveld finds that local chiefs enable external investment by alienating land without consulting constituents, often in return for substantial cash payments or gifts.¹⁰ On the other hand, customary tenure can be difficult for outsiders to understand. Scott argues that these property rights systems are less externally “legible.”¹¹ And where existing property claims and the rules for acquiring land are difficult to discern, external investors incur high transaction costs.

Our conceptual framework organizes these competing claims. Private property entails individual and transferable titles, while the customary system allows customary authorities to influence the allocation of land. Which system generates more external investment depends on the relative transaction costs and price of acreage under the two systems. If less externally legible customary systems generate prohibitive transaction costs, we should expect greater investment under a system of private property. But if customary authorities use their power to displace existing landholders, this could attract investors seeking cheap tracts of land.

We study a natural experiment in the West African state of Liberia—a case frequently used to illustrate both the promise and the peril of outside investments in primary commodities. Liberia offers an excellent inferential opportunity because of a unique institutional feature: parallel property rights systems existed in different parts of the country. In the County Area, settlers established a formal system of private property. By contrast, Liberian law stipulates that customary property rights govern land in the Hinterland, more than forty miles inland from the coast.

We use panel data to look at whether, following the global food crisis, we see differential changes in land clearing on either side of this institutional boundary. We employ a difference-in-differences estimation strategy to isolate the differential

6. See also Wily 2011.

7. Wily 2012.

8. Lawry 2012.

9. Kabia 2014.

10. Schoneveld 2017, 125.

11. Scott 1999.

changes generated by the external demand shock.¹² To bolster our empirical strategy, we restrict attention to an area around the institutional boundary with similar pre-crisis trends in land clearing and a comparable agro-climatic, demographic, and socioeconomic profile. We find a larger increase in land clearing in the County Area, where private property rights prevail. We unpack this result, showing that export-oriented agricultural concessions expand more rapidly in the County Area. Restricting attention to these concession areas, we see more land clearing within concessions in the County Area. Thus property rights systems appear to affect both the extensive and intensive margins for external investment. Customary authorities do not invite external investment; if deterring land acquisition by outsiders is the policy goal, our results do not support titling campaigns and the dismantling of customary tenure.

A case study of Golden Veroleum Liberia, a major palm oil concessionaire, provides more evidence on mechanisms. We uncover costly negotiations between the company and local authorities. Initially, these high transaction costs were offset by promises to displace existing landholders. However, local mobilization (augmented by international advocates) increased scrutiny and deterred large-scale displacement.

Conceptual Framework

Past work in international political economy argues that foreign investors favor states that protect private property. Much of this research focuses on the commitment problem facing investors—an obsolescing bargain, in which host countries later revise the terms of investment to capture more value from fixed assets.¹³ Scholars have emphasized two solutions: democratic institutions that constrain expropriation by host governments,¹⁴ and international agreements (especially bilateral investment treaties) that codify dispute-settlement procedures.¹⁵

Yet, in weak states, investors worry less about expropriation. Moreover, such concerns cannot explain subnational variation in investment. Instead, our framework emphasizes two factors that affect the costs paid by external investors looking to acquire land: transaction costs related to the legibility of property rights, and the price of acreage. We argue that both factors depend, in part, on whether customary authorities intermediate deals related to land or investors transact directly with titleholders.

With respect to legibility, the current literature devotes little attention to how private property simplifies acquisition by outsiders.¹⁶ Yet, the delineation of land

12. As a robustness check, we implement a regression discontinuity design using cross-sectional data from before and after the global food crisis (see Appendix A4 in the online supplement).

13. Frieden 1994.

14. Jensen 2008; Li and Resnick 2003.

15. See Milner 2014 and Pandya 2016 for recent reviews.

16. Like Scott 1999 we adopt an encompassing definition of external investors, which includes foreign and also domestic actors who are unfamiliar with the local property rights regime.

titles allows external investors (or, historically, settlers) to acquire a land parcel without first needing to understand the local property regime. “The imposition of free-hold property,” Scott argues, “was clarifying not so much for the local inhabitants—the customary structure of rights had always been clear enough to them—as it was for the tax official and land speculator.”¹⁷ Private property rights facilitate land acquisition by lowering transaction costs for external investors. Customary systems, by contrast, require investors to consult and negotiate with local authorities. These negotiations often occur in contexts where use and transfer rights remain murky (sometimes contested), and formal institutions cannot effectively resolve boundary disputes.

Despite these transaction costs, investors may still prefer to negotiate with customary authorities. Under private property, investors must pay the price demanded by individual titleholders. Customary authorities, however, can affect the allocation of land.¹⁸ Kabia explains:

A chief can also take arable land away from a subject due to neglect and or non-utilization . . . The chief’s power in this instance is unchecked, resulting in a unilateral decision to divest land. In that way, the chief’s discretion under African customary law can become a pretext for land transactions that exclude the local people’s input.¹⁹

Authorities may use this power to offer investors a below-market price (i.e., a price lower than what the land user would demand if they held a title). Intermediation by customary authorities creates a moral-hazard problem: chiefs do not care only about the well-being of their constituents who work the land but also value the additional rents they can earn from external investment deals. Where interests diverge and customary authorities are not fully accountable to their constituents, they may be willing to accept a below-market price and displace existing land users to make way for external investments that pay larger rents.²⁰ This, Deininger and Byerlee argue, is why investors increasingly favor states like Liberia, where weak property rights allow them to acquire land “essentially for free and in neglect of local rights.”²¹ Ryan observes that, more often, the usufruct rights of women and other groups with less

17. Scott 1999, 39.

18. Even when incorporated into more pluralistic systems, customary property regimes tend to privilege the interests of elites (relative to other land users) in allocating land. Boone 2014; Wily 2012.

19. Kabia 2014, 719.

20. Schoneveld 2017. Where customary authorities fully internalize constituents’ interests (due to accountability or benevolence), this agency problem does not exist. And there are contexts where chiefs act to advance their constituents’ interests: Baldwin (2013, 798) shows that Zambian chiefs catalyze local service provision; Ryan 2018 notes disagreements among local authorities in Sierra Leone regarding the benefits of large-scale land deals. Yet, chiefs—sometimes described as local autocrats—do not regularly stand for elections, and other accountability mechanisms (e.g., elite councils) permit discretion. Casey et al. 2018.

21. Deininger and Byerlee 2011, 55. Government officials have made similar claims: João Carrilho, of Mozambique’s National Directorate of Lands and Forestry, observes, “You can give twenty bicycles to a

capacity to contest authorities are neglected when land is “made available” for external investment.²²

Whether external investors prefer to negotiate with local authorities in the customary system or transact with titleholders in the fee simple system depends (all else being equal) on whether any discounts on acreage offered by local authorities more than offset the transaction costs associated with a less legible customary system. Appendix A1 (in the online supplement) formalizes these arguments.

Context

Global Food Crisis and External Land Investment

The global food crisis of 2007–08 revived interest in the determinants of external investment in land. Both long-term trends (e.g., population growth) and acute changes (e.g., drought-induced crop failures and rising fuel prices) led to a dramatic rise in food prices.²³ The Food and Agriculture Organization’s cereal price index increased by 280 percent between 2000 and 2008 (Appendix Figure A2); world prices for palm oil and rubber, which are major commercial crops in Liberia, followed similar trends (Appendix Figure A3). While the FAO’s price indices fell from their highs in 2008, they remained elevated through 2014 relative to the early 2000s.

This led to a huge spike in land demand, particularly in Africa, “where two-thirds of such demand is concentrated and where demand in 2009 alone was equivalent to more than twenty years of previous land expansion.”²⁴ According to the Land Matrix’s database, between 2000 and 2006, ninety-one land deals had been implemented across Africa; by 2014 that number increased to 791 (Appendix Figure A4).²⁵ Liberia was a recipient: less than a decade after its second civil war, De Wit reports “conservative projections” indicating that 75 percent of Liberia has been committed for long-term land agreements.²⁶

Land Administration in Liberia

Liberia provides a unique opportunity to evaluate the effects of intermediation by customary authorities on external investment. Liberian law divides the country into two zones:

The territory of the Republic shall be divided for the purpose of administration into the County Area and Hinterland. The County Area shall include all territory

local chief and get a big piece of customary land. This is why we need to ... see that everyone has a title. That way it will be a lot harder for people to come in and take over their land.” Quoted in French 2014, 219.

22. Ryan 2018, 193.

23. United Nations 2011, 66–71.

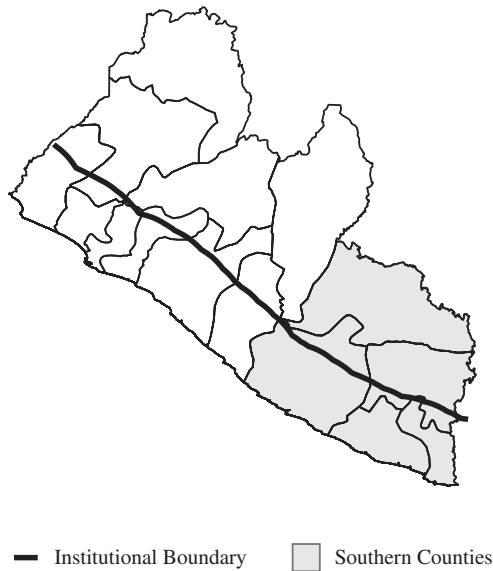
24. Deininger 2011, 217.

25. The database can be accessed at <<https://landmatrix.org/data>>.

26. De Wit 2012, 1. Commodity price increases coincide with Ellen Johnson Sirleaf’s election as president in 2005. Her international standing may have amplified the demand shock from the global food crisis.

extending from the seaboard forty miles inland and from the Mano to the Cavalla Rivers. The Hinterland shall commence at the eastern boundary of the County Area; i.e., forty miles inland and extend eastward as far as the recognized limit of the Republic.²⁷

Figure 1 maps the institutional boundary, which the law regards as the dividing line between the two property rights systems. In the County Area, there exists a “western statutory system of land ownership based on individual fee simple titles.”²⁸ (Fee simple titles are the highest possible ownership interest under common law; holders can alienate, divide, or hand down their property.) In the Hinterland, customary authorities (a hierarchy of chiefs and other elders) govern communal land; individuals or families living in these areas typically enjoy rights short of full ownership.



Notes: The solid line cutting across counties represents the institutional boundary forty miles inland from the coast. We identify a set of “southern counties” (Grand Gedeh, Grand Kru, Maryland, Sinoe, and River Gee) where this boundary is less salient, and exclude these counties in some analyses.

FIGURE 1. *Formal institutional boundary between Liberia’s property rights systems*

27. Government of Liberia 1956.

28. USAID 2016.

The forty-mile boundary was never a sharp discontinuity. First, some land in the County Area is held under customary tenure²⁹ and, as we discuss later, a cumbersome process permits the alienation of communal land in the Hinterland. Although hybrid regimes exist on either side of the boundary customary authorities play a larger role in allocating land in the Hinterland, where individual titles are far less common. Second, the institutional boundary is less salient in the country's southeast (shaded in gray in the figure). The southeast was a separate colony, settled by the Maryland Colonization Society, and was not annexed until 1857, thirty-five years after the founding of Liberia.³⁰ As Unruh notes, the forty-mile boundary codified a practice of providing fee simple titles to members of the American Colonization Society, who occupied the northwest.³¹ Because both the settlers and extents of inland settlement differed in the southeast, the forty-mile boundary in this part of the country does not map onto the historical titling efforts that established private property rights in the County Area (Appendix Figure A5).³²

Historical accounts do not explain why settlement did not extend beyond forty miles: Christy writes only that “it was plain [to settlers] that the Constitution could not operate beyond that limit.”³³ The boundary does not separate identified physiographic zones: both sides feature rolling hills and plateaus and (before more recent forest clearing) dense, well-watered forests.³⁴

Land Investment Under Liberia's Property Rights Systems

How do these different property rights systems affect external investments in land?

First, in the Hinterland, most landholdings remain undocumented.³⁵ Instead, community members often rely on natural landmarks and oral histories to identify the boundaries of their land.³⁶ A 2015 World Bank report observes that external investors in Liberia's hinterland must sort out vague, overlapping claims to land, and “local systems for managing these claims—generally a standard hierarchy of customary authorities—are not equipped to manage these conflicts in concession areas.”³⁷ This is not unique to Liberia; Scott refers to it as the “illegibility of communal tenure.”³⁸

Second, a much larger proportion of land in the Hinterland is communal property, which cannot be alienated or used as collateral without permission from customary authorities. Any proposed alienation of these lands necessitates an impracticable process of acquiring

29. Lawry 2012, 9.

30. Akpan 1973; Laughon 1941.

31. Unruh 2008.

32. These two sources of interference motivate two research design choices: (1) our regression discontinuity design excludes the area right at the boundary, where we expect (de facto) institutional differences to be more muted; and (2) we exclude the southern counties in some analyses.

33. Christy 1931, 523.

34. Christy 1931.

35. Stevens 2014.

36. Wily 2007.

37. World Bank Justice for the Poor Program, United Nations Development Program, and United Nations Peace Building Support Office 2015, 29.

38. Scott 1999, 37–39.

a tribal certificate. A tribal certificate requires both a survey order from the president of Liberia and then the president's signature on the deed.³⁹ Even land held by families (separate from community land) cannot be sold or leased without permission of the authorities and elders who claim indigenous status in the community.⁴⁰

Negotiating a long-term land lease in the Hinterland requires investors to unravel local property claims and negotiate with customary authorities.⁴¹ This could raise transaction costs, but also permits land deals that could not be concluded under a system of private property. The World Bank summarizes: "Communities and individuals in concession areas [often] lack formal ownership rights under the current law, despite the fact that they have long inhabited or productively used the land ... Concessionaires have generally been left to develop their own policies with regard to these claims."⁴² Without title or even clear legal status, land users can be displaced from their plots without adequate compensation; in the absence of a functioning land market, prices could be set (artificially low) by unaccountable local authorities.⁴³

By contrast, land administration in the County Area was designed by settlers and so has always been more legible to outsiders. Land deeds and maps exist (though they are poorly organized) that identify owners of specific plots. The status of land is also well defined, with a large proportion held by private individuals. A legal land market exists, with a bureaucracy that supports the process of transferring title. The same World Bank report cited earlier outlines the simpler process for external investors acquiring privately owned land in Liberia: "the concessionaire generally negotiates directly with the owner to lease the land and provide annual lease payments."⁴⁴

Past work finds that *de jure* differences in property rights do not affect investment where they do not codify different practices.⁴⁵ Using geocoded survey data from Round 4 of the Afrobarometer (enumerated in 2008), we find that customary authorities do indeed play a larger role in the allocation of land in the Hinterland. Respondents in the Hinterland more often report that traditional leaders or community members should have responsibility for allocating land, a difference of fourteen percentage points; they are, by contrast, less inclined, by nineteen percentage points, to believe prices should affect how land is distributed (Appendix Figure A8).⁴⁶ Respondents in the

39. Stevens 2014.

40. Wily 2007.

41. Legally, much of the Hinterland was regarded by the central government as "public land" during our study period. In practice, local customary authorities controlled access. Stevens 2014. While the central government has described large portions of this land as "unencumbered" to facilitate concession agreements, such claims reflect (willful) ignorance of customary authority and existing land use. De Wit 2012.

42. World Bank Justice for the Poor Program, United Nations Development Program, and United Nations Peace Building Support Office 2015, 29.

43. Christensen, Hartman, and Samii find that constituents struggle to hold chiefs in the Hinterland accountable for their management of communal forestland: households, they observe, "either cannot, or do not see it as their role, to scrutinize chiefs' decisions." *Forthcoming*, 2.

44. World Bank Justice for the Poor Program 2015, 28.

45. Bubb 2015.

46. Appendix A4 lists the survey questions used in this analysis. We restrict attention to enumeration areas within forty kilometers (25 miles) of the institutional boundaries and not in the southern counties.

Hinterland also more often report (by 13 percentage points) that traditional leaders influence how their communities are governed.⁴⁷ As we have noted, hybrid systems exist in both the Hinterland and the County Area, and yet there is systematic variation in the role of customary authorities across these two zones.

For that reason, Liberia offers an opportunity to evaluate our conceptual framework: all else equal, external investors in Liberia must weigh the illegibility of property claims in the Hinterland against the cost savings that may be offered by customary authorities, who more often intermediate land negotiations in that part of the country.

Empirical Strategy

Our interest in external investment focuses our attention on the demand shock induced by the global food crisis of 2007–08; we opt for a difference-in-differences approach, which estimates differential changes in investment during this period of greater external demand. By contrast, baseline differences in investment under the two property rights systems—for example, due to geographic or historical features of the County Area and Hinterland—cannot be entirely attributed to the external demand shock. Our difference-in-differences strategy does not leverage such level differences and thus seems better suited to our substantive interest than a regression discontinuity with cross-sectional (endline) data. Specifically, we estimate:

$$y_{it} = \alpha_i + \gamma_t + \beta D_{it} + \eta X_{it} + \varepsilon_{it} \quad (1)$$

where i indexes the one-square-kilometer grid cells that serve as our cross-sectional unit; t indexes the year; and D_{it} is an indicator variable that takes a 1 in the County Area after 2007. X_{it} is a matrix of time-varying covariates. In addition to the checks we describe that validate our identifying assumption and demonstrate robustness to different analysis choices, we also report specifications that substitute the year fixed effects for county-by-year fixed effects. (Figure 1 maps county boundaries.)

The difference-in-differences estimation strategy rests on a parallel-trends assumption: that investment would have followed the same trend had there been no difference in the property rights systems. Though it is untestable, we bolster the credibility of this assumption in three ways. First, we focus on a relatively narrow bandwidth around the forty-mile boundary that divides the two property rights systems.⁴⁸ In Appendix A4, we show that similar agro-climatic conditions, ethnic compositions, and socioeconomic characteristics exist within our bandwidth on either side of the institutional boundary. Thus we expect that trends on the Hinterland side of the boundary provide a credible estimate of counterfactual land clearing or concession activity on the County side. We also implement a regression discontinuity (RD) design with data from before and after the global food crisis, using

47. We do not find more reported land conflict (which could deter external investors) in the Hinterland.

48. The forty-kilometer (twenty-five mile) bandwidth maintains balance in pretreatment trends while also allowing reasonably precise estimation (Appendix Figure A13).

an optimal bandwidth of just seven kilometer and distance to the institutional boundary as the forcing variable. Our RD coefficients generate the same conclusion but are larger in magnitude than our difference-in-differences estimates (Appendix Table A2) because the RD results reflect cumulative changes in 2014 and include (insignificant) level differences not attributable to the demand shock.

Second, readers may still be concerned about residual imbalances, even within this narrow bandwidth. Any time-invariant differences, for example, in growing conditions or past conflict exposure, will be absorbed by our unit fixed effects and not confound our analysis. To alleviate concerns about time-varying confounds, we show in Appendix Tables A4 and A6 that interacting static differences in demographics, conflict exposure, or market access with an indicator for the period after the global food crisis does not meaningfully affect our estimates.⁴⁹

Finally, we show both in the raw data (Figure 3) and in the placebo tests reported in Appendix Figure A13 that investment on either side of the boundary follows similar trends before the global food crisis. The absence of differential pre-trends in our outcome variable increases confidence that trends across the boundary would have remained parallel in the absence of the external demand shock.

We take two approaches to constructing our standard errors. First, we cluster on district. This allows for serial correlation across the entire study period but assumes that administrative boundaries delimit spatial autocorrelation. Second, following Conley, we allow for serial correlation over a ten-year window, as well as spatial autocorrelation among cells that fall within fifty kilometers of each other.⁵⁰ We find that clustering on district tends to be more conservative. While nominally we have over two million grid cells, our clustering accounts for the possibility that outcomes in adjacent cells are highly correlated and ensures that we do not underestimate our level of uncertainty.

Data

Forest Loss

Our main outcome data come from Hansen and colleagues who provide information on annual forest cover loss from 2000 to 2014 at a high spatial resolution (30 meters at the equator).⁵¹ We aggregate to roughly one-kilometer resolution by creating blocks (36 × 36) of the original cells.⁵² Forest loss is the complete removal of the

49. Electoral support for President Sirleaf does not split along the institutional boundary. Rather, her opponent in the 2005 election, George Weah, drew his support from the southern counties (particularly Grand Gedeh, Grand Kru, Sinoe, and River Gee). We drop these counties in models 2 and 4.

50. Conley 1999. The code to compute Conley's spatial HAC standard errors does not currently permit the inclusion of unit-by-year fixed effects, as in models 3 and 4 of Table 1. To keep the dimensions of the distance matrix manageable, we use random samples of 50,000 cells to compute these standard errors.

51. Hansen et al. 2013.

52. Aggregation eases computation but does not detract from our design. We do not leverage a sharp geographic discontinuity, so lowering the spatial resolution does not introduce consequential interference;

tree-cover canopy. Our dependent variable, cumulative forest loss, measures the proportion of cell i that experienced forest loss in or before year t .

Forest loss provides a good measure of land conversion, particularly in Liberia.⁵³ First, Hansen and colleagues argue that these data can be used to better understand “the economic drivers of natural forest conversion to more intensive land uses,”⁵⁴ and some studies have used the measure to study concession activity in other contexts.⁵⁵ Second, as is apparent in [Figure 3\(b\)](#), at the beginning of our time series less than 1 percent of cells within our bandwidth had experienced forest loss. Thus we are unlikely to miss changes in land use on already deforested land. Third, forest loss captures investments related to agricultural concessions (e.g., clearing and destumping to prepare the land for planting).

We show this empirically by estimating the increase in forest loss associated with active concession agreements. Starting with a simple before–after comparison, in the year before an agricultural concession starts, forest loss averages just over 5 percent; by 2014 that rate increases to over 14 percent. [Appendix Table A1](#) reports difference-in-difference estimates to account for time-invariant confounders and secular trends in forest loss. These results indicate that forest loss increases dramatically after a cell is incorporated into an agricultural concession.

Concession Areas

To map external investments, we acquired concession boundaries from Liberia’s National Bureau of Concessions in 2016. Concession agreements are contractual arrangements between an investor and the government of Liberia that grant tracts of land for commercial development.⁵⁶ Even if local residents or communities are not legal parties to concession agreements, they negotiate with concessionaires over land use. These data include twenty-five unique concession holders (excluding community-managed forests): eight in agriculture (totaling 553,400 hectares), ten in forestry (1,047,100 hectares), and seven in mining (339,500 hectares).⁵⁷ These data include the start date for each concession, which allows us to plot the area held under concession agreements over time ([Figure 2](#)). Agribusiness activity increases after

and we adjust our standard errors to account for spatial dependence (and temporal autocorrelation), so we do not sacrifice power by aggregating small, adjacent cells with highly correlated outcomes.

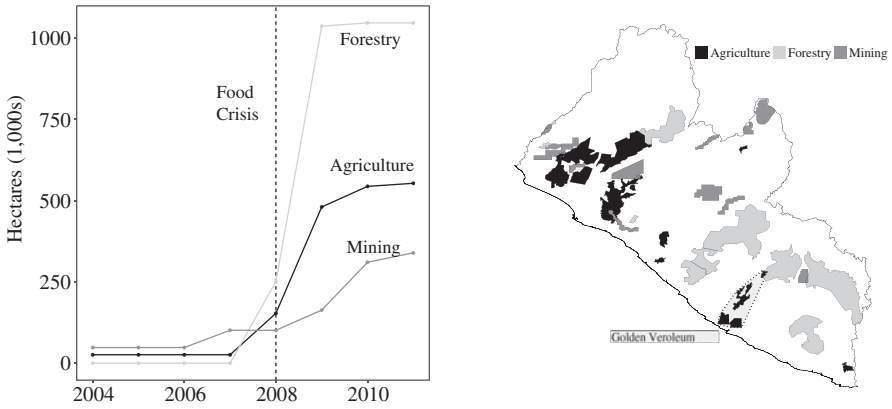
53. These data do not attribute forest loss to external investments versus domestic industry. As we describe in the empirical strategy section, we leverage the external demand shock brought on by the global food crisis to better isolate land conversion attributable to external investment.

54. Hansen et al. 2013, 853.

55. For example, Abood et al. 2015; Gaveau et al. 2016.

56. Any protections (or risks) the central government provides to investors apply throughout the country, in both the County Area and the Hinterland.

57. The small number of concession holders limits our exploration of investor-level heterogeneity. The most expansive data set of concessions, from Bunte et al. 2018, includes investors from twenty-four different countries, with the US, China, Australia, the UK, and Canada being most frequent. Our data from the Bureau of Concessions include foreign agribusiness investors from the US, Luxembourg, Malaysia, and Singapore.

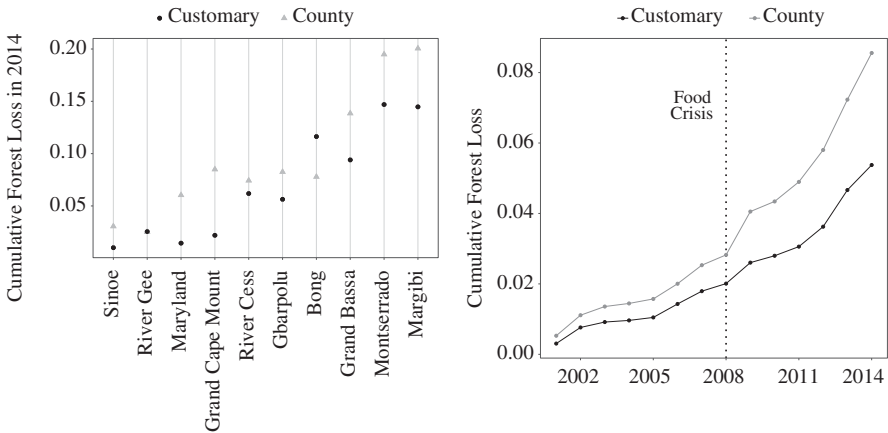


(a) Area within commercial concessions

(b) Commercial concession boundaries

Notes: The graph represents data from the National Bureau of Concessions. The map shows a convex hull around Golden Veroleum's concession (dotted line), the subject of our qualitative analysis.

FIGURE 2. Current concession activity in Liberia



(a) Cumulative forest loss in 2014 by county and property rights system

(b) Cumulative forest loss by year and property rights system, 2001–2014

Notes: Both figures use data prior to aggregating to the larger (36x36) grid cells and restrict the sample to cells within forty kilometers of the institutional boundary.

FIGURE 3. Cumulative forest loss across the institutional boundary

2007.⁵⁸ This increase mirrors regional and global trends: Appendix Figure A4 shows a dramatic rise in land investment deals across Africa, Asia, and the Americas in the half-decade following the global food crisis).

These areas reflect the concession boundaries, not the area under production. Some agricultural and forestry concessions have seen little activity, due in part to the challenges of negotiating access to land. Hence, we use the forest-loss measure, which better captures actual land use.

Results

Forest Loss

Our main findings are apparent in the descriptive statistics in Figure 3. We restrict our attention to areas within forty kilometers (25 miles) of the institutional boundary and first look within counties bisected by the boundary. With one exception (Bong), by 2014 less forest land has been cleared on the customary side (Figure 3(a)). Within the same county and our relatively narrow band around the boundary, we see more forest loss where private property rights prevail.

Second, in Figure 3(b) we plot cumulative forest loss on either side of the institutional boundary. While levels of clearing activity were slightly lower in the Hinterland, we see parallel trends in forest loss until 2007. However, after 2008, clearing activity picks up more sharply in the County Area. While cumulative forest loss increases by roughly five percentage points in the County Area between 2008 and 2014, it increases by only three points in the Hinterland.

Table 1 presents our difference-in-difference estimates from equation (1). These models include a fixed effect for every one-square-kilometer cell, absorbing all time-invariant characteristics that affect whether an area is cleared (e.g., distance to the coast or capital, soil suitability, historic settlement patterns). Moreover, we include year or county-year fixed effects. The latter allow for nonparametric time trends in each county, picking up temporal variation in weather or local governance that could affect clearing. Finally, in models 2 and 4, we drop the southern counties (as discussed earlier). As expected, our estimates increase in magnitude when we exclude the southeast, where the forty-mile institutional boundary does not map onto a historic divide between the private property and customary systems. Our results are robust to using narrower bandwidths of thirty, twenty, or ten kilometers when we use Conley's standard errors for inference (Appendix Table A7).

58. Figure 2 also shows increases in mining and forestry. The increase in mining relates to a steady and dramatic increase in mineral prices through most of our study period. The sharp rise in forestry concessions in 2009 results from policy changes that established new permitting categories for timber extraction.

TABLE 1. *Differential change in forest loss following food crisis*

	Dependent variable			
	<i>Cumulative Forest Loss</i>			
	(1)	(2)	(3)	(4)
$1(\text{COUNTY}) \times \text{POST-2007 } (D_{it})$	0.015	0.022	0.013	0.017
Clustered on district	(0.005)**	(0.006)**	(0.004)**	(0.005)**
Spatial HAC (10 y, 50 km)	(0.003)**	(0.003)**		
Mean(y_{it})	0.029	0.04	0.029	0.04
Drop southern counties		✓		✓
Cell FEs	148,544	89,654	148,544	89,654
Year FEs	14	14		
County-year FEs			196	126
Observations	2,079,616	1,255,156	2,079,616	1,255,156

Notes: Linear models per Equation (1). All models include cell and year or county-year fixed effects. The sample is limited to cells within forty kilometers of the institutional boundary, and the unit of observation is a one-square-kilometer cell observed in each year. The dependent variable is the proportion of each cell that has experienced forest loss. ** $p < .05$.

We conduct two falsification exercises. First, to demonstrate that the divergence reported in Table 1 is due to the external demand shock and not differential trends prior to the global food crisis, we code a series of “placebo” crises using the years before 2008. Appendix Figure A13 reports null effects for these placebo crises. Second, we also look for differential changes around placebo boundaries: fake boundaries twenty or sixty miles from the coast that do not correspond to the real institutional boundary (Appendix Figure A14). In Appendix Figure A15, we show that forest loss does not differentially increase after the food crisis on the coastal side of these placebo boundaries.

Our research design rules out many potential confounding factors. The cell fixed effects absorb all time-invariant features that might affect land clearing. Moreover, by looking only at a band around the institutional boundary, we minimize differences in agro-climatic, conflict, demographic, or market access variables.⁵⁹ Any remaining variation along these dimensions confounds our analysis only if it also moderates the external demand shock. As a check, we interact the available census variables with an indicator for the post-2007 period. Despite losing nearly half of our sample in the merge, our estimates remain significant and of similar magnitude (Appendix Tables A4 and A5). Similarly, road density, distance to Monrovia, or the average distance to ports are not driving the differential increase we observe in the County Area following the external demand shock (Appendix Table A6).

59. We find no significant difference in wealth across the institutional boundary (Appendix Figure A10). Data on landholdings do not exist, but the sizes of households' plots are less relevant to external investment in the customary area, where the chief can alienate large, multiplot tracts.

Finally, the year fixed effects absorb country-wide shocks, such as the global recession, 2011 general election, or ubiquitous policy reforms. We also include county-year fixed effects—flexible time-trends for each of Liberia’s fifteen counties. With county-year fixed effects, confounds would have to come from unobserved, time-varying features at the sub-county level. One such confound could be a concurrent land or forestry reform that boosts clearing and investment in the County Area relative to the Hinterland. This is implausible for two reasons. First, implementation of such reforms has been halting. To take the most prominent example, the Legislature established a land commission in 2009 to reform land policy. The new Land Rights Act was not passed until 2018, four years after our study period. Second, the reforms that have passed (e.g., the 2009 Community Rights Act) have attempted to rationalize the customary system and minimize differences across the property rights systems. If anything, we would expect such reforms to attenuate our results.

TABLE 2. *Expansion of agricultural concessions (extensive margin)*

	Dependent variable					
	1 (Agricultural Concession)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\alpha(\text{COUNTY})$	0.072*	0.101*				
	(0.038)	(0.056)				
D_{it}			0.058*	0.083	0.077**	0.113**
			(0.034)	(0.050)	(0.028)	(0.044)
CONSTANT	0.066**	0.105**				
	(0.029)	(0.042)				
Mean(y_{it})	0.102	0.155	0.048	0.075	0.048	0.075
Drop southern counties		✓		✓		✓
Cell FEs	0	0	148,544	89,654	148,544	89,654
Year FEs			14	14		
County-year FEs					196	126
Observations	148,544	89,654	2,079,616	1,255,156	2,079,616	1,255,156

Notes: Linear probability models estimated using cross-sectional data from 2014 (models 1 and 2) or panel data (models 3–6). All panel models include cell and year or county-year fixed effects. The sample is limited to cells within forty kilometers of the institutional boundary, and the unit of observation is a one-square-kilometer cell observed in each year. The dependent variable is whether the cell falls within an active agricultural concession. Robust standard errors clustered on district. * $p < .10$; ** $p < .05$.

Concessions: Land Acquisition

We attribute these differential changes in forest loss to external investments following the global food crisis, and our difference-in-differences strategy helps isolate the effect of greater global demand. We can marshal more direct evidence that the increase in land clearing is attributable to external investment by looking at the scale of agricultural concessions (the extensive margin) and the rates of clearing within those concessions (the intensive margin). This helps unpack our forest-loss outcome, which captures changes along both margins.

We look first at the likelihood that a cell falls within an agricultural concession. Cross-sectional data from 2014 indicate that cells in the County Area (still within forty kilometers of the institutional boundary) are twice as likely to fall in an agricultural concession: 10 percent in the Hinterland and 20 percent in the County Area (Table 2, model 2). Estimates for equation (1) show that the probability of falling within an agricultural concession increased more dramatically in the County Area after the global food crisis (models 3–6).

Clearing: Land Use Within Concessions

Not only was more land acquired for agricultural concessions, but on the intensive margin we find more rapid clearing within agricultural concessions in the County Area. We start in Table 3, models 1 to 3, by analyzing the cross-section in 2014. In the Hinterland, cumulative forest loss in agricultural concessions was about 9 percent; within concessions in the County Area, total loss amounted to around 17 percent.

TABLE 3. *Forest loss within agricultural concessions (intensive margin)*

	Dependent variable						
	<i>Cumulative Forest Loss</i>						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1(AGRIC.)	0.047** (0.018)	0.026 (0.018)	0.068** (0.019)	0.015** (0.006)	0.001 (0.006)	0.024** (0.007)	0.016 (0.011)
1(COUNTY)	0.023** (0.010)	0.036** (0.013)	0.001 (0.010)				
1(AGRIC.) × 1(COUNTY)	0.045* (0.026)	0.041 (0.029)	0.067** (0.030)	0.023** (0.009)	0.027** (0.010)	0.023** (0.010)	0.026** (0.010)
CONSTANT	0.052** (0.009)	0.075** (0.011)	0.031** (0.008)				
Mean(y_{it})	0.071	0.101	0.073	0.029	0.04	0.03	0.038
Drop southern counties		✓			✓		✓
Eventual concession			✓			✓	✓
Cell FEs	0	0	0	148,544	89,654	42,161	29,800
Year FEs	0	0	0	14	14	14	14
Observations	148,544	89,654	42,161	2,079,616	1,255,156	59,0254	417,200

Notes: Linear probability models estimated using cross-sectional data from 2014 (models 1–3) or panel data (models 4–7). The sample is limited to cells within forty kilometers of the institutional boundary, and the unit of observation is a one-square-kilometer cell observed in each year. The dependent variable is the proportion of each cell that has experienced forest loss. Robust standard errors clustered on district. ** $p < .05$.

In models 4 to 7, we amend our panel model, estimating

$$y_{it} = \alpha_i + \gamma_t + \delta 1(\text{Agric.})_{it} + \phi 1(\text{Agric.})_{it} \times 1(\text{County})_i + \varepsilon_{it} \quad (2)$$

where $1(\text{Agric.})_{it}$ indicates whether a cell falls within an agricultural concession. δ captures the effect of concessions on forest loss in the Hinterland; ϕ indicates

how much larger that effect is in the County Area.⁶⁰ While concession activity leads to higher rates of land clearing under both property rights systems, this effect is more than twice as large in the County Area. (In models 3, 6, and 7, we restrict the sample to cells that are eventually incorporated into concessions.)

We find that both the area acquired for agricultural concessions and the rate of clearing within those concessions are greater in the County Area, where external investors more often directly transact with titleholders.

Qualitative Evidence on Mechanisms

Qualitative evidence helps illuminate why intermediation by customary authorities deters external investment in Liberia. Specifically, we analyze the case of Golden Veroleum Liberia (GVL), and its efforts to establish and operate the country's largest palm oil concession.⁶¹ Signed in 2010 and reportedly worth USD 1.6 billion, GVL's concession agreement identifies 350,000 hectares.⁶² The concession agreement does not acknowledge the individuals already using this same tract of land.

GVL's experience provides evidence of high transaction costs related to the illegibility of customary property and the involvement of local authorities. In 2010, the central government lacked a clear process for awarding concessions, like GVL's, that include communal land. (Even five years after GVL's agreement, Global Witness reports that "Liberia's rapid agricultural expansion is taking place in a legal vacuum with companies governed only by voluntary promises and the concession agreements they sign with the government, many of which risk violating international laws, such as those protecting community land rights.")⁶³ Accordingly, GVL's concession agreement omits mention of communally held land or the relevant customary authorities.⁶⁴

After recognizing customary authorities' control over communal land within their concession area, in 2013 GVL began entering into memoranda of understanding (MoUs): community-level plans that describe the terms of investment. These

60. These conditional-on-positives estimates are subject to confounding if property rights systems change the types of concessions on both sides of the boundaries. Angrist and Pischke 2009, 99.

61. We selected GVL as a case because it is one of the largest concessions during our study period, and a feasibility check revealed enough sources to plausibly code the variables of interest. We preregistered our hypotheses and qualitative analysis plan before deciding which agribusiness concession to study or viewing any of the qualitative data on this concession. We completed only one case study due to the limited number of relevant primary and secondary sources.

62. GVL's concession is in the southern counties of Sinoe and River Gee (Figure 2), where the forty-mile institutional boundary does not as clearly delineate the property rights systems. As we discuss, GVL undertook extensive negotiations with customary authorities; its experience thus helps characterize the consequences of this intermediation.

63. "Global Witness Report: The New Snake Oil: Violence, Threats and False Promises at the Heart of Liberia's Palm Oil Expansion," Business and Human Rights Resource Center, July 2015, <<https://www.business-humanrights.org/en/latest-news/global-witness-report-the-new-snake-oil-violence-threats-and-false-promises-at-the-heart-of-liberias-palm-oil-expansion/>>.

64. Ministry of Foreign Affairs 2010.

MoUs include records of numerous community meetings, refer to boundary demarcation exercises, describe compensation, and include pages of community leaders' signatures (in many cases a smudged thumbprint).⁶⁵ This process of meetings, mapping untitled land, and attaining signatures from leaders (paramount and local chiefs, elders, and others) in each community generated significant costs and delayed clearing and planting activities.⁶⁶

At least initially, it appears that GVL anticipated the displacement of untitled land users, which would lower their costs for acreage. A 2010 report notes that within GVL's concession there are no protections for land users and cautions that displacement is likely.⁶⁷ GVL concedes that forced displacement took place between September 2010 and January 2013; a report by the Forest Trust documents sixteen cases where GVL took land from users without permission or, by implication, adequate compensation.⁶⁸

In GVL's case, the extent of displacement was checked by a prompt response from communities and advocacy organizations. In 2011, only a year after the concession agreement was signed, affected community members submitted a formal complaint to the Roundtable on Sustainable Palm Oil. The prospect of cheaply displacing existing landholders may have attracted GVL to untitled communal land, but any hope of savings dissipated as community members successfully contested its efforts to acquire their land without adequate compensation.

GVL's case provides qualitative evidence that the illegibility of communal property and negotiations with local authorities drove up transaction costs. Moreover, while authorities initially promised GVL low prices based on the displacement of existing landholders, local mobilization (augmented by international advocates) increased scrutiny and deterred large-scale displacement.

Discussion

Debates about whether customary institutions invite "land grabs" turn on conflicting claims about whether intermediation by customary authorities facilitates external investment in land. If investors balk at the transaction costs associated with less legible customary systems, then we expect more investment where private property prevails. However, if chiefs or other local authorities can depress land prices, then investors may be wooed by cheap, if ill-gotten, acreage.

The net effect of these competing forces is an empirical question. We use a natural experiment in Liberia. Historically, Liberian law established parallel private and customary property rights systems. We look at changes in land clearing and concession

65. MoUs from October 2013 through February 2017 are at <<http://goldenveroleumliberia.com/index.php/downloadable-content/memorandums-of-understanding>>.

66. Wright and Tumbey Jr. 2012.

67. Sustainable Development Institute 2010, 10.

68. Forest Trust 2013.

activity on either side of this institutional boundary following the global food crisis of 2007–08. By using a major external demand shock, we isolate changes attributable to external land investments.

We find greater rates of forest loss—a measure of land conversion to more intensive uses—in the County Area, where private property exists. Our estimates are roughly half the mean of the dependent variable and similar in magnitude to the change in land clearing in the first four years of peace after the Liberian Civil War. Analyzing the expansion of agricultural concessions and clearing activity in those concessions, we show that institutional differences affect both the extensive and intensive margins of investment.

Looking into a major palm oil concession, we uncover complementary qualitative evidence. We find, first, that the involvement of customary authorities drives up transaction costs; and second, that authorities initially promised low prices to the concessionaire based on plans to displace existing landholders. Yet, scrutiny of the deal halted large-scale displacement.

While our findings reveal the role of institutions in enabling external investments in land, they do not quantify the welfare effects of concessions. Edwards's recent research in Indonesia finds that “at least 1.3 million out of the approximately 10 million people lifted from poverty over the 2000s have escaped poverty due to growth in the oil palm sector.”⁶⁹ This contrasts with more pessimistic accounts of displaced Indonesian landholders' bleak employment prospects.⁷⁰ Building on the initial work of Bunte and colleagues we need careful welfare assessments of the impact of Liberia's concessions.⁷¹ Lanier, Mukpo, and Wilhelmsen's case studies of palm oil and iron ore concessions in Liberia raise concerns about inadequate compensation for landholders, limited positive spillovers, and corruption.⁷²

Data Availability Statement

Replication files for this article may be found at <<https://doi.org/10.7910/DVN/UJZY4C>>.

Supplementary Material

Supplementary material for this article is available at <<https://doi.org/10.1017/S0020818321000187>>.

69. Edwards 2017, 4.

70. For example, Li 2011.

71. Bunte et al. 2018.

72. Lanier, Mukpo, Wilhelmsen 2012.

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