Secured Transactions Laws and Economic Development on American Indian Reservations[*]

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Online Appendix

1 Background on Tribal Secured Transactions Laws

Secured Transactions Laws (STLs) create interests in personal property before or simultaneous to the undertaking of a debt obligation, in contrast to state lien laws that arise by operation of law and typically create an encumbrance on property of the debtor after the obligation has been undertaken and is overdue (United States Bankruptcy Code 101 (37), (51), 2012). STLs usually refer to encumbrances on personal property as opposed to real property or land, though some overlap occurs when personal property is affixed to land in a way that implicates real property law (Roark, 2009).[1]

In 2002, the ULC, a state-created body that drafts and then promotes the adoption of uniform legal texts in different jurisdictions, convened with tribal representatives to design a uniform code (Henning and Miller, 2008). In 2001, the Minneapolis FED conducted a study that found "as [tribal] economies expand and capital needs increase, [tribal] governments need to cultivate an environment conducive to entrepreneurship, lending and investment. A key component of that type of environment is a legal infrastructure that supports contract enforcement and facilitates commercial activity" (Hawkland, 2017). The ULC ultimately promulgated a model secured transactions code for Indian Tribes known as the Model Tribal Secured Transactions Act (MTSTA) with the aim to "cultivate an environment conducive to entrepreneurship, lending, and investment" in tribal territories (Hawkland, 2017). The MTSTA was a simplified version of UCC Article 9, which was previously created by the ULC and the American Law Institute (Berg, 2006). Every state in the U.S. has adopted the UCC with minor variations achieving its goal of uniformity in secured transactions law. Taking into account the input from tribal leaders, the MTSTA was aimed at preserving tribes' cultural integrity and sovereignty by eliminating or modifying provisions from UCC Article 9 that were believed to create problems in the context of tribal enactment, such as provisions governing fixtures that implicate real property rights, and self-help, that enable creditors to proceed with foreclosures without judicial involvement in limited instances (Shoemaker, 2020).

Currently, sixty-two Indian tribes have adopted a STL (Roark, 2020). These laws fit into five broad categories: tribes that have incorporated the Uniform Commercial Code (UCC) adopted by the state where they are located; (or in close regional proximity to their tribal territory) tribes that have adopted the ULC's version of the UCC; tribes that have adopted the MTSTA; tribes that have adopted uniform provisions relating to the sales of accounts

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[1]Examples of personal property include "movable" property (equipment, livestock, minerals removed from the ground), payment obligations and financial instruments (accounts receivable, bank accounts), general intangibles (licenses, trademarks), and fixtures (property that has attributes of personal and real property such as installed water heaters or furnace).

or chattel paper; or tribes that have adopted a non-uniform law governing the creation of security interests within their tribal territories. In addition to these different modes of adopting secured transactions laws, there is a distinction in some legislation about what entities have access to the tribal laws on secured transactions: some legislation is adopted only for the benefit of the tribe or other tribal enterprises, while some legislation does not designate a class of persons for whom the law is designed to facilitate secured lending (Roark, 2020).

There is also substantial variation in how tribes have structured their filing systems (Henning et al., 2018). Some tribes have opted to maintain their own recording system within the confines of either a tribal court or some other tribal administrative office. Others have opted to utilize the local (geographically proximate) filing system of the state in which their territory is located. And finally, some tribes have created compacts with those states for the purposes of maintaining tribal filings (Roark, 2020). Tribal adoptions of STLs vary along two key dimensions: how model legislation was adopted, and what filing system was used.

Following Roark (2020), we classify laws as "uniform" if a tribe adopts uniform text with no modification; "selective" if a tribe adopts a uniform text that has been modified to limit the type of entity or the types of transactions the law will apply to;[2] and "non-uniform" if the text was not derived from a uniform code. We classify filing systems as "state" if tribe has contracted with the state to use their secured transactions filing systems; "local" if the tribe has created its own filing system; or "none" when no filing system could be identified.

Selective/state adoptions indicate that tribes have adopted a uniform law selectively, but incorporated state filing systems. In this group, 9 of the 12 tribes were identified as selective because they limited the application of the law to tribal enterprises, tribal property, or the tribe itself. The results for selective/state adoptions may reflect the internal growth of the tribal assets, such as casinos, hotels, or other properties that generate revenue within the tribal territory. State filing may be important if the tribe is doing business outside the tribe, or is procuring assets that vendors or lenders may want to establish priority claims over. In the traditional UCC Secured Transaction, this would include not only tangible assets such as equipment and inventory, but also rights to payments in accounts and chattel paper.

Selective/local adoptions generate economic activity where there was limited activity before. In this group, 6 of the 9 tribes were identified as selective because they limited the transaction type to sales of accounts or chattel paper. In both sales of accounts and the

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[2]Nearly all of the selective adoptions were one of two varieties: limiting transactions to sales of accounts or sales and chattel paper or instruments (what the law applies to) or limiting use of the code to tribal enterprises (who gets to use the law).

sale/transfer of chattel paper, the primary property interest that is being transferred is the right to collect a payment. In the sale of an account, the payment is unsecured by other property, whereas the sale/transfer of chattel paper constitutes the transfer of the right to payment and the right to enforce a security interest against personal property collateral (Freedheim and Goldston, 1953, p. 74). Sales of rights to payment have been associated with the extension of cheap credit because of the ability to convert a legal right to payment into immediate cash value (Roark, 2014, p. 93-95). This low-cost form of lending is often crucial in developing economic activity because it enables creditors to either accept a transfer of the obligation for immediate cash, or to hold the security interest in the event of a default by the debtor.

2 Additional Information on Data Used and Supplemental Results

Variable	(1) N	(2) Mean	(3) Std. Dev.	(4) Min.	(5) Max.	(6) Definition
Avg. Lights	2,441,516	1.635235	5.717029	0	63	Avg. Nightime Luminosity in PLSS Section (from DMSP-OLS dataset)
1(Lit)	2,441,516	.1882261	.3908927	0	1	=1 if Avg. Nightime Luminosity in PLSS Section>0; 0 otherwise
Uniform/State (1)	2,441,516	.0478117	.2133676	0	1	=1 if reservation has previously adopted a uniform STL with a state filing system; 0 otherwise
Selective/State(2)	2,441,516	.2181964	.4130215	0	1	=1 if reservation has previously selectively adopted an STL with a state filing system; 0 otherwise
Uniform/Local (3)	2,441,516	.0010805	.0328528	0	1	=1 if reservation has previously adopted a uniform STL with a local filing system; 0 otherwise
Selective/Local (4)	2,441,516	.0678554	.2514976	0	1	=1 if reservation has previously selectively adopted an STL with a local filing system; 0 otherwise
Non-Unfirom/None	2,441,516	.0097611	.0983152	0	1	=1 if reservation has previously adopted a non-uniform STL with a local filing system; 0 otherwise
Miles to Border	2,441,516	8.368704	9.517847	0	59.1929	Miles from PLSS section to reservation border
1(Casino Compact)	2,441,516	.4190331	.4934009	0	1	=1 if reservation has previously entered a casino gaming compact; 0 otherwise
Alt. 1(Casino Compact)	1,907,136	.256246	.4365594	0	1	=1 if reservation has previously entered a casino gaming compact; omits reservations with no compact data

Table 1: **Summary Statistics.**

This table presents summary statistics for the data used in the main estimating sample. Dates of gaming compact adoption were compiled from publicly available records associated with the Indian Gaming Regulatory Act. Other data sources and construction are described in the text.

2.1 Night Lights Data and the Public Land Survey System

We construct our annual panel using the NOAA DMSP-OLS Nighttime Lights data for 1992 to 2013 (the most recent year available) (National Geophysical Data Center, National Oceanic and Atmospheric Administration, 2019). This data set consists of a smoothed, cloud-free composite of night time satellite images across a calendar year. The result is an index of night-time light intensity ranging from 0 to 63 measured at a 30-by-30 arc second (approximately 1-km^2 or 250-acre) resolution. We calculate the average annual nighttime luminosity for each square-mile "section" in the Public Land Survey System (PLSS) that overlaps a Native American Reservation in each year (Bureau of Land Management, 2017). The PLSS is a rectilinear grid that divides most of the United States into 36-square mile townships, but it does not cover the full contiguous United States and therefore we focus on a subset of reservations. The data exclude Georgia, Connecticut, Delaware, Kentucky, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, South Carolina, Tennessee, Vermont, Virginia, and West Virginia who do not follow the PLSS. Future work will more comprehensively consider reservations in these states.

Each section in our analysis is an average of roughly 2.5 pixels from the nightlights data. Hence, there may be some spillovers between sections in the data. Because we are not trying to identify a treatment that varies from one section to the next and we cluster observations by reservation, we do not think this is a major concern. One additional caveat of the nightlights data is that they are "top-coded" at 63, which means that at some point

they fail to capture intensive-margin increases in economic activity. Hence, these data would not be well-suited to studying policy impacts in a highly urbanized environment like Los Angeles or New York, where most cells would be top-coded. We do not think this a major concern in our setting because there are relatively few reservations in highly urbanized areas.

2.2 Supplemental Results

Here, we provide several extensions to provide evidence of the robustness of our basic empirical design. First, we omit the Navajo Nation from our results. Second, we control for the rise of casino gaming during our sample window using information about when different reservations entered gaming compacts to allow casinos. We address the rise of casinos by controlling for the timing of gaming compact adoptions by reservation.

The Navajo Nation, which selectively adopted a the UCC text with a state filing system in 1986, could have an outsize impact on our results due to its large size. The Navajo Nation alone is comprised of 23,648 square-mile PLSS sections, meaning that it contributes over 520,000 observations to the panel data set. This, coupled with the fact that much of the Navajo Nation is rugged, remote, and uninhabited, could influence our results. Table 2 reports the results. Broadly, the results are very similar to our baseline. This is especially true in columns 2, 4, and 6, which include individual township fixed effects. This provides support for our intuition that the inclusion of high-resolution spatial fixed effects helps control for unobserved heterogeneity (such as ruggedness) that could significantly impact development on reservations.

Our approach for addressing the rise of casinos is to introduce a time-varying control for whether a reservation had entered into a gaming compact in a given year. Specifically, we use publicly available date associated with the Indian Gaming Regulatory Act to construct an indicator that is equal to zero up until a specific reservation enters a gaming compact, and then equal to one beginning in the year after the compact. We include this variable under two different assumptions about reservations for which we could not identify a compact date. In Table 3, we assign a value of zero to reservations with no compact date, assuming that they did not have a compact. In Table 4, we omit reservations for which we could not identify a compact date, focusing only on the *timing* of adoption for the subset of reservations for which we identified a compact. An alternative approach would be to measure the prevalence casinos directly, but we are not aware of data on casino gaming that vary annual (most previous studies have focused on changes between waves of the decadal census).

Table 3 indicates that our core results are practically unchanged by the inclusion of a control for casino compacts. In Table 4, the effect of Type-2 adoptions (selective adoption with a state filing system) becomes robust, especially in columns that utilize township and

state-by-year fixed effects. This is not especially concerning, given that this specification drops over 500,000 observations and focuses only on those casinos that had gaming. The rest of the coefficients are not substantially different from those reported in our main results.

	(1)	(2)	(3)	(4)	(5)	(6)
	ihsLight		*1(Lit)*		*lnLight*	
Uniform/State (1)	0.105	0.0662	0.0367	0.0206	0.125	0.102
	(0.100)	(0.0646)	(0.0268)	(0.0182)	(0.0379)	(0.0290)
Selective/State (2)	0.0372	0.0632	0.0168	0.0209	0.0945	0.103
	(0.0265)	(0.0572)	(0.00816)	(0.0232)	(0.0306)	(0.0573)
Uniform/Local (3)	0.0694	0.00229	-0.00840	-0.0275	-0.0395	-0.0202
	(0.0433)	(0.0610)	(0.0107)	(0.0153)	(0.0374)	(0.0170)
Selective/Local (4)	0.134	0.145	0.0619	0.0697	-0.0224	-0.00720
	(0.0389)	(0.0410)	(0.0176)	(0.0163)	(0.0407)	(0.0592)
Non-Uniform/None (5)	-0.0174	0.0153	-0.00430	0.00659	-0.0495	-0.0266
	(0.0211)	(0.0282)	(0.00894)	(0.0104)	(0.0277)	(0.0511)
Fixed Effects	R,Y	T,SY	R,Y	T,SY	R,Y	T,SY
Observations	1,323,542	1,323,498	1,323,542	1,323,498	115,082	115,082
# Fixed Effects	108	12,246	108	12,246	108	1,230
Adjusted R-squared	0.374	0.686	0.290	0.594	0.271	0.630

Table 2: **The Effect of Adopting A Secured Transaction Law (STL) on Nighttime Lights, Omitting the Navajo Nation.**

To maintain a balanced panel, columns 5-6 only include sections that have positive luminosity over 1992-2013. Columns 1, 3, and 5 include reservation and year fixed effects; columns 2, 4, and 6 include township and state-by-year fixed effects. The coefficients in columns 1,2,5, and 6 can be interpreted as percentage changes in luminosity, whereas the coefficient in columns 3 and 4 can be interpreted as *percentage point* changes in the probability that a section is lit (this baseline probability is 18.8%). This table drops all observations on the Navajo Nation, which is extremely large but has relatively sparse development. Standard errors are clustered by reservation (N = 158).

	(1)	(2)	(3)	(4)	(5)	(6)
	ihsLight		1(Lit)		lnLight	
Uniform/State (1)	0.118	0.0796	0.0416	0.0252	0.123	0.102
	(0.101)	(0.0558)	(0.0267)	(0.0152)	(0.0361)	(0.0275)
Selective/State (2)	0.0524	0.211	0.0183	0.103	0.118	0.141
	(0.0256)	(0.0800)	(0.00480)	(0.0411)	(0.0251)	(0.0548)
Uniform/Local (3)	0.0893	0.0172	-0.00363	-0.0229	-0.0230	0.0140
	(0.0390)	(0.0501)	(0.00935)	(0.0128)	(0.0336)	(0.0193)
Selective/Local (4)	0.143	0.153	0.0655	0.0734	-0.0140	0.00844
	(0.0348)	(0.0427)	(0.0158)	(0.0176)	(0.0393)	(0.0747)
Non-Uniform/None (5)	-0.00707	0.0240	-0.000425	0.0113	-0.0431	-0.0165
	(0.0153)	(0.0227)	(0.00590)	(0.00848)	(0.0278)	(0.0481)
1(Casino Compact)	0.00678	-0.0199	0.00242	-0.00755	-0.00258	-0.0120
	(0.0180)	(0.0211)	(0.00714)	(0.00841)	(0.0241)	(0.0246)
Fixed Effects	R,Y	T,SY	R,Y	T,SY	R,Y	T,SY
Observations	2,441,516	2,441,472	2,441,516	2,441,472	219,890	219,890
# Fixed Effects	180	26,943	180	26,943	180	2,073
Adjusted R-squared	0.362	0.701	0.281	0.610	0.267	0.636

Table 3: **The Effect of Adopting A Secured Transaction Law (STL) on Nighttime Lights, Controlling for Casino Gaming Compacts.**

To maintain a balanced panel, columns 5-6 only include sections that have positive luminosity over 1992-2013. Columns 1, 3, and 5 include reservation and year fixed effects; columns 2, 4, and 6 include township and state-by-year fixed effects. The coefficients in columns 1,2,5, and 6 can be interpreted as percentage changes in luminosity, whereas the coefficient in columns 3 and 4 can be interpreted as *percentage point* changes in the probability that a section is lit (this baseline probability is 18.8%). This table controls for the rise of casinos on reservations with a time-varying indicator, 1(Casino Compact) that is equal to zero until a reservation enters a casino gaming compact, and one thereafter. In this table, we assume that reservations for which we could not identify a compact date do not have casinos. Standard errors are clustered by reservation (N = 158).

	(1)	(2)	(3)	(4)	(5)	(6)
	ihsLight		*1(Lit)*		*lnLight*	
Uniform/State (1)	0.144	0.0975	0.0428	0.0256	0.114	0.111
	(0.145)	(0.0889)	(0.0379)	(0.0240)	(0.0433)	(0.0354)
Selective/State (2)	0.0520	0.0843	0.0170	0.0300	0.123	0.0876
	(0.0268)	(0.0954)	(0.00557)	(0.0391)	(0.0243)	(0.0543)
Uniform/Local (3)	0.0915	0.0225	-0.00354	-0.0220	-0.0181	0.0143
	(0.0398)	(0.0502)	(0.00958)	(0.0128)	(0.0336)	(0.0188)
Selective/Local (4)	0.144	0.147	0.0650	0.0689	-0.00669	0.00921
	(0.0358)	(0.0407)	(0.0162)	(0.0163)	(0.0414)	(0.0753)
Non-Uniform/None (5)	-0.00672	0.0127	-0.00108	0.00423	-0.0413	-0.0150
	(0.0165)	(0.0291)	(0.00648)	(0.0110)	(0.0277)	(0.0488)
1(Casino Compact): Alt. Versio	0.00448	-0.0290	0.00251	-0.0117	-0.00981	-0.00512
	(0.0177)	(0.0197)	(0.00703)	(0.00859)	(0.0221)	(0.0179)
Fixed Effects	R,Y	T,SY	R,Y	T,SY	R,Y	T,SY
Observations	1,907,136	1,907,114	1,907,136	1,907,114	164,494	164,494
# Fixed Effects	145	24,652	145	24,652	145	1,775
Adjusted R-squared	0.332	0.689	0.248	0.597	0.278	0.625

Table 4: **The Effect of Adopting A Secured Transaction Law (STL) on Nighttime Lights, Controlling for Casino Gaming Compacts (Alternate Version).**

To maintain a balanced panel, columns 5-6 only include sections that have positive luminosity over 1992-2013. Columns 1, 3, and 5 include reservation and year fixed effects; columns 2, 4, and 6 include township and state-by-year fixed effects. The coefficients in columns 1,2,5, and 6 can be interpreted as percentage changes in luminosity, whereas the coefficient in columns 3 and 4 can be interpreted as *percentage point* changes in the probability that a section is lit (this baseline probability is 18.8%). This table controls for the rise of casinos on reservations with a time-varying indicator, 1(Casino Compact) that is equal to zero until a reservation enters a casino gaming compact, and one thereafter. In this table, we omit reservations for which we could not identify a compact date. Standard errors are clustered by reservation (N = 158).

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3 Event Study Results
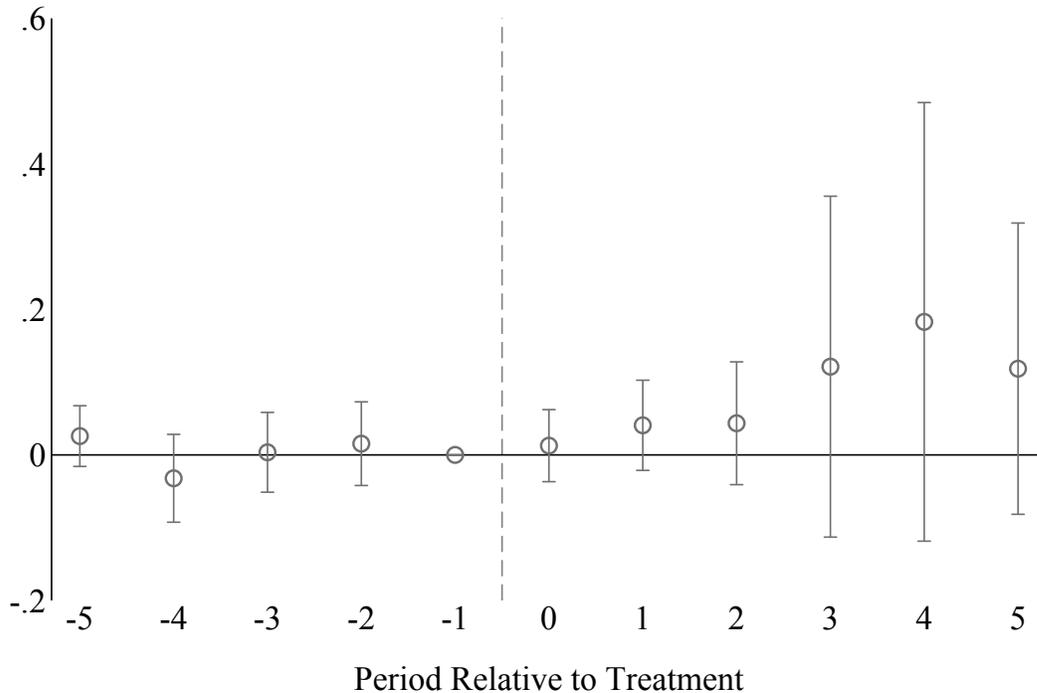
Figure 1: **Event-Study Analysis of the Effect Adopting any Secured Transaction Law (STL)**

We note the absence of pre-trends to the adoption of secured transaction laws (STL) in Section II. This absence of pre-trends is documented in Figure 1. We bin two years into the end points of the event study, i.e. -5 is identified from 5 and 6 years before adoption, and 5 is identified from $+5$ and $+6$ years after adoption. The absence of pre-trends is precisely estimated with tight confidence bands. The effect of STL is most visible (albeit imprecisely so) three and four years out from the adoption. This suggests that it takes two-three years for the benefits of STL to manifest themselves. The effect tapers off somewhat five and six year after the adoption, although it has to be noted that for a number of the later adoptions do not have a five- or six-year post-adoption year in the sample, which makes that comparison difficult.

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