"Shocking Behavior: Land Lotteries in 1832 Georgia and 1901 Oklahoma and Later Life Outcomes "

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1. Introduction

An enduring question in social science is how much wealth affects behavior. The standard approach in economics is to think of wealth as the budget constraint, which determines the set of feasible consumption. In a world where capital markets are perfect, wealth determines how much you can consume, but it does not affect the efficiency of investments that you make. In contrast, if we depart from this perfect-market assumption, people without wealth may find it impossible to make positive NPV investments in themselves or their children.

But if we see in the cross-section that those with more wealth undertake more investments, it doesn't mean that wealth necessarily relaxes the constraint on investment. Some individuals might also have access to better investment opportunities in human or physical capital. Herein lies the difficulty in diagnosing whether family wealth is an important input to producing human capital, or simply an indicator of higher underlying productivity.

In this study, we examine some unusual episodes in US history: land lotteries. These were events that generated a shock to an individual's wealth that we can plausibly expect was exogenous

to their characteristics. The cost of entering these lotteries was generally quite low and they were open to a large segment of the population. These episodes provide something rare in the analysis of the impact of wealth on behavior: changes in wealth that are likely not associated with underlying differences across individuals in productivity.

These episodes are also relevant to understanding the importance of "free land" to the development of the US economy. The importance of a frontier, imparting wealth to anyone who would claim it, has figured in many interpretations of US history, such as in the work of Habakkuk and Turner.

2. Background on the lotteries

2.A Northwest Georgia, 1832

The state of Georgia is quite unusual in the US in that much of the state's territory was distributed through a series of land lotteries. The initial Georgia colony was concentrated around the Savannah River, and this land was distributed through a more traditional grant-based system. However, a corruption scandal circa 1800 provoked such popular outrage that the Georgia Legislature opted to use lotteries as methods of distributing land from then forward. The first lottery took place in 1805 and the last ones were held in the 1830s.

For this study we consider the 1832 lottery of Cherokee County in northwest Georgia. We choose to focus on the 1832 lottery because the list of winners was available and the later date increases the chance of tracking these people in census data. The land in this area was made available to settlers of European descent by the eviction of the Cherokees in that area. (This eviction precipitated what is known today as the "Trail of Tears") Essentially every adult male who had been

resident for at least three years in Georgia by 1832 was eligible to one draw in this lottery. Widows, orphans, and certain veterans were eligible for two draws. (Because we wouldn't know in the control group who was a widow, orphan, or veteran, we exclude them from the treated group in our analysis. Practically speaking, this is of little consequence because our sample excludes females and excludes years of birth that the veterans of orphans would disproportionately populate.) A group of highwaymen called the "pony club" that operated in old Cherokee County was also explicitly excluded from the lottery, but this group was trivially small compared to the population of the state. Lists of the eligible population were constructed by each county government and forwarded to the state capital, which was at the time in Milledgeville.

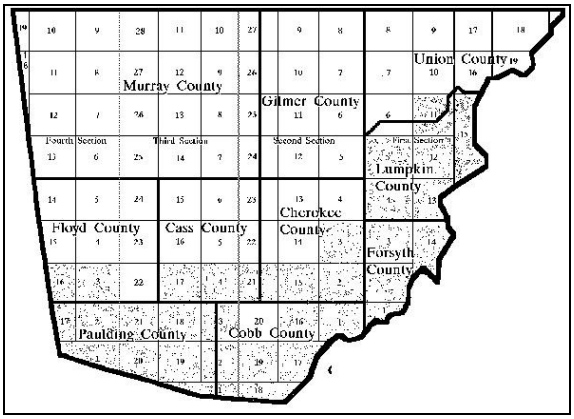
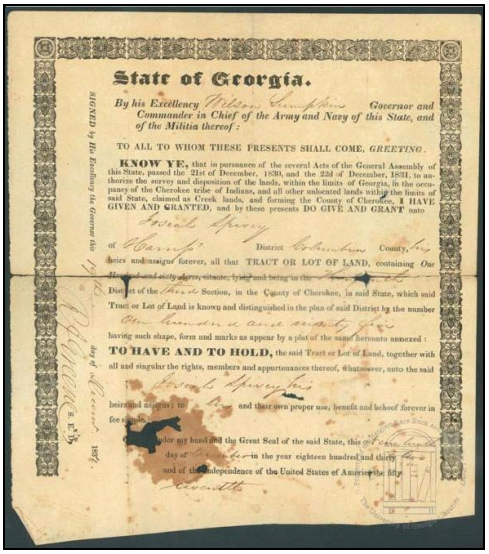


Figure 1.

Concurrent with this, the area known at the time as Cherokee County was divided into four sections, which were further subdivided into dozens of districts. The districts were generally square, except for those that were on the boundaries of the original Cherokee County, which were defined by the state border to the north and west, and by the Chattahoochee River to the southeast. Surveyors were sent to each district with the aim of further subdividing it into an 18-x-18 grid of square parcels of 160 acres each. Oftentimes the surveying was imprecise, and so the surveyors would create fractional parcels to fill out whatever leftover space there was after the main allocation. The surveyors also collected information about topographical features, such as mountains and rivers, as well as man-made features such as roads and structures. The counties into which the Cherokee Lands were divided are shown in Figure 1.

After the surveys were completed and the lists of eligibles were collected, the lottery began. The drawing proceeded as follows. One drum was filled with slips of paper containing the registration information on each eligible person. Another drum was filled with slips of paper specifying a parcel. A slip of paper was drawn simultaneously from each barrel to determine who had won which parcel. This implies that winning and losing was assigned randomly, and also that the specific parcel awarded to an individual, even conditional on winning, was random. Over 18,000 parcels were assigned in this manner.



State of Georgia.

By his Excellency Wilson Lumpkin Governor and Commander in Chief of the Army and Navy of this State, and of the Militia thereof:

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING.

KNOW YE, that in pursuance of the several Acts of the General Assembly of this State, passed the 21st of December, 1830, and the 22d of December, 1831, to authorize the survey and disposition of the lands, within the limits of Georgia, in the occupancy of the Cherokee tribe of Indians, and all other unlocated lands within the limits of said State, claimed as Creek lands, and forming the County of Cherokee, I HAVE GIVEN AND GRANTED, and by these presents DO GIVE AND GRANT unto

Josiah Spivey

of Cherokee District Columbia County, his heirs and assigns forever, all that TRACT OR LOT OF LAND, containing One Hundred and sixty acres, situate, lying and being in the

District of the Third Section, in the County of Cherokee, in said State, which said Tract or Lot of Land is known and distinguished in the plan of said District by the number One hundred and seventy four

having such shape, form and marks as appear by a plat of the same hereunto annexed:

TO HAVE AND TO HOLD, the said Tract or Lot of Land, together with all and singular the rights, members and appurtenances thereof, whatsoever, unto the said

Josiah Spivey his

heirs and assigns to the only proper use, benefit and behoof forever in fee simple.

In testimony whereof I have hereunto set my hand and caused the Great Seal of the said State, this [illegible] day of December in the year eighteen hundred and thirty two and of the Independence of the United States of America the fifty seventh

Figure 2.

Very few requirements were imposed on the winners of the lottery. They were not required to homestead the parcel for any amount of time. They were not even required to set foot on their parcel. They simply had to register their claim with the state government and pay a nominal fee. If they wished, they could immediately resell title to that parcel. Indeed, it is likely that many of the winners took this route. One factor that made this sort of "flipping" attractive is that it took six years before the state of Georgia could effectively exercise its jurisdiction over this land. The Cherokee nation fought the eviction through the legal system, and the state of Georgia was not able to evict the Cherokees until 1838. Information on the parcels as well as a list of winners was circulated throughout the state and compiled into a single source by Smith (1838). Figure 2 shows the deed awarded to one of the winners, Josiah Spivey.

A rough measure of the value of a winning draw in the lottery can be obtained by calculating the average value of a farm in the 10 counties of Northwest Georgia in 1850 when the U.S. Census

first provides the information necessary to make this calculation. These counties contained 1.5 million acres of farmland (improved and unimproved); the 7,236 farms in these counties had a total cash value of $8.9 million (1850 dollars), of which $407,000 was implements and machinery. This yields a land value in 1850 of $5.71/acre, or just over $900 for a farm of 160 acres. If winners held their land until 1850, we would expect them to be $900 richer. If they sold it before and bought land with a similar NPV, we would expect the same. These effects might be attenuated however: wealth could be held in other forms (e.g. personal estate, including the value of slaves, which we do not observe until the 1860 census); wealth could be consumed (in a variety of forms: direct consumption goods or larger family sizes); those who flipped the land quickly may have received less than the land's NPV because of uncertainty about the timing of the expulsion of the Cherokees.

Roughly the bottom third of Cherokee County was distributed in 40 acre parcels instead as part of a "gold lottery". It was thought that this area was particularly rich in gold deposits, an assumption which proved to be optimistic. (For this study, we examine only winners in the "Land Lottery" section of old Cherokee County.)

2.B Southwest Oklahoma, 1901

Much of southwest Oklahoma was distributed in a lottery that took place in the late summer of 1901. The territory opened up for settlement by the lottery had been occupied by the Kiowa, Comanche, Apache, and Wichita tribes for several decades prior. Unlike the rest of the state, which had been allocated through land rushes and auctions, the Department of the Interior chose a lottery mechanism to allocate land. The soon-to-be-opened territory (see Figure 3, in the southwest corner of the state, just east of Greer County)

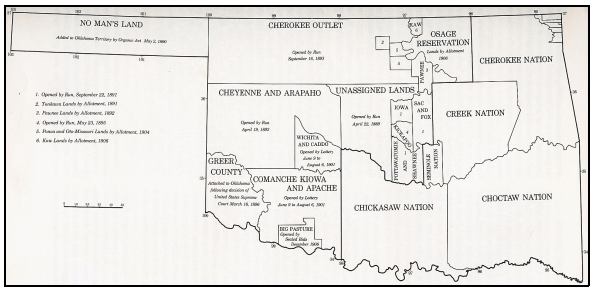


Figure 3

was split into two districts: El Reno and Lawton. Over the course of several weeks in July 1901, agents of the General Land Office (GLO) received registrations for the lottery, and the actual drawing started on 29 July and continued for approximately a week. A total of 13,000 lots of 160 acres in size were made available in this lottery, and approximately 170,000 people registered for the drawing.

Instead of randomly assigning people to parcels as in the Georgia 1832 lottery, the Oklahoma mechanism gave the first drawers the first right to stake their claims. Thus, the order in which people were drawn in the lottery was in effect a rank ordering of the amount of wealth, at least in option value, that the individuals had won. For purposes of transparency, the name of every single registrant was drawn from the boxes, although only the first 6500 in each district had actually won anything. Various newspapers in the region reported the first 13,000 names drawn. For the work here, we reference the *Kansas City Star* as well as Anderson and Bearden (1997) for the list of winners and their rank order. Various contemporary press accounts estimate that the very first drawers had one between $20,000 and $40,000 in wealth (for example, *Idaho Daily Statesman*, "Telephone Girl Lucky Gambler", July 30, 1901). In theory, drawer number 6500 also won land wealth, although the actual take-up rate of high-numbered drawers was low enough to suggest that the value of such land was low relative to the registrants' opportunity cost. Further, analysis by Bohanon and Coehlo (1998) suggests that any *ex ante* rents were more than dissipated in this lottery by the 1-in-12 chance of winning and the direct and opportunity costs of registering for the drawing.

Because the lottery was run by the federal government, eligibility was more expansive than the Georgia lotteries. Any adult citizen who was a household head was eligible to register for the lottery. Practically speaking, this that married women were excluded, and, in fact, several women who married soon after winning the lottery a lost their claim to land. But, apart from this criterion,

anyone who could get themselves to the two registration sites in southwest Oklahoma could register. Eligible individuals were permitted precisely one draw, and so anyone who was found to have registered more than once was completely disqualified. Soldiers were allowed to register through agents, although each agent was only permitted one registration by proxy (Roberts, 1902).

In the early fall of 1901, lottery winners were called in to the GLO field office to stake their claim. The winners with lower numbers were given earlier dates to report, or else forfeit their place in the queue. There was ample time between the drawing and the registration of claims, so the winners would have a chance to go out into the territory and survey possible locations. Also, local guides were available, for a fee, to help scout out possible claim sites. When the time came to formally stake their claim, lottery winners would present themselves at the GLO, where officials would help them outline the precise claim on a map of the territory that was displayed for public inspection. This helped ensure transparency in the process and avoided duplicate claims. The parcels were always 160 acres, and were generally square. (It was not a requirement that the parcel be square, and one noteworthy exception was the first claimant in the Lawton District, who selected a thin slice of land that ran around the border of one of the new town sites.)

Claimants were require to homestead this parcel for three years before their claim was official. (This represents a major difference between this lottery and the one in Georgia.) This implies that winning the lottery represents more than a change in wealth but also a change in the returns to occupational and locational choice. (These features of the lottery were known *ex ante*, and therefore the pool of registrants was very likely selected on people who were predisposed to these choices in any event.)

3. Data

The present study proposes to follow up on the outcomes of lottery winners in the two episodes described above. There are two principal ingredients to this exercise, in both episodes, so we describe them here. First, we need to identify who won. This is done using original and secondary sources that described the lotteries. Second, we need to find these individuals in later, publicly available data sources, so as to follow up on their outcomes. For the most part, we search for these individuals in the Census manuscripts of 1850-1930 using indices found on ancestry.com. In the remainder of this section, we discuss the details specific to each lottery episode.

3.A. Georgia, 1832.

The original source for the names of lottery winners in the 1832 Georgia land lottery is Smith (1838). He lists, in numerical order, each parcel that was available and the associated lottery winner, along with the winner's county and minor civil division in 1832. Smith's list was partially transcribed and available on accessgenealogy.com, which we downloaded, cleaned, and compared with a copy of Smith (1838) that we scanned and transcribed with an OCR program.

In order to generate a control and treatment group for this lottery, we took advantage of the lottery's entry requirements: individuals had to be 18 years or older in 1832 and resident in Georgia for at least three years by 1832. We extracted all males from the complete count file of the 1850 U.S. Census who met two criteria: (1) they had at least one child born in Georgia in the three years prior to 1832; and (2) they had no children born outside of Georgia in those same years. This yielded a population of 15,675 individuals. Of these, 1,676 were then identified in the list of lottery winners based on their surname and given name. These individuals were then sought in the 1850 census manuscripts to obtain their 1850 real estate value; the complete count file directly provided the other

outcomes we will explore below (county of residence in 1850, and marital status in 1850 and the number of children born between the 1832 lottery and the 1850 census). For example, Josiah Spivey (whose winning deed is shown in Figure 2 above) was located in 1850 in Township 23 of Tallaposa County, Alabama (Figure 4). He appears with his wife Mary and son James (born 1828 in Georgia) beginning at line 7 and reported $1,200 in real estate wealth in 1850. We have checked how the list of eligibles from 2 counties (Coulmbia and Oglethorpe) compares with the male population of those counties in the 1830 census. In our sample, 16.8% are matched to the Smith list. In Columbia county, 16.0% of the eligible names were drawn.

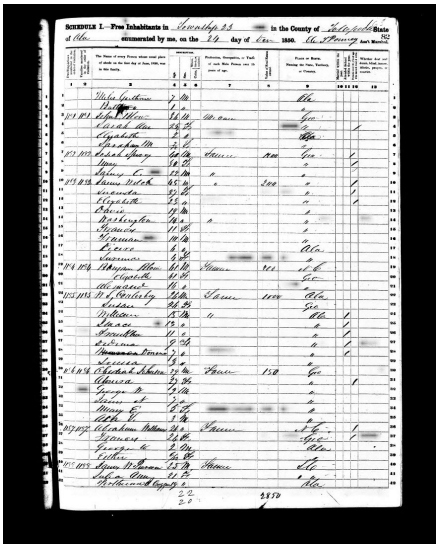


Figure 4.

Figure 5

3.B. Oklahoma, 1901

The data generating process for Oklahoma was different. Winners were initially linked back to the 1900 U.S. Census (in order to provide information with which to test the exogeneity of winning with respect to pre-lottery characteristics, and also to provide identifying information such as year of birth and place of birth to facilitate the matching to the 1910 post-lottery census). The backward linkage was done using each winner's full name together with the state or territory and exact place of residence they reported when they entered the lottery. Each individual was required to report the location to which the General Land Office would mail notification if the individual was not present at the time of the drawing. The entry for Mora Davey of Skelton, Illinois is shown in Figure 5. Davey's "Last residence" is listed as Skelton, which is in Oran Township, in the eastern

part of Logan County, Illinois. Davey was searched in the 1900 U.S. Census of Population, where his record was found in Oran Township (Figure 6).

His 1900 census entry (Figure 7, starting at line 7) reports he was a male servant, born January, 1878 in Illinois. He was unmarried, both parents were born in Ohio, and he was able to both read and write. This information was then used to locate his record in the 1910 U.S. Census of Population to examine his post-lottery characteristics. Of the 6,500 1901 lottery winners from the Lawton drawing, we located 1,580 in the 1900 Census and subsequently have located 529 of these in the 1910 Census. These numbers will rise as we move from an automated search algorithm to a manual search. The results reported here pertain solely to the 529 obtained in this first pass through the census.

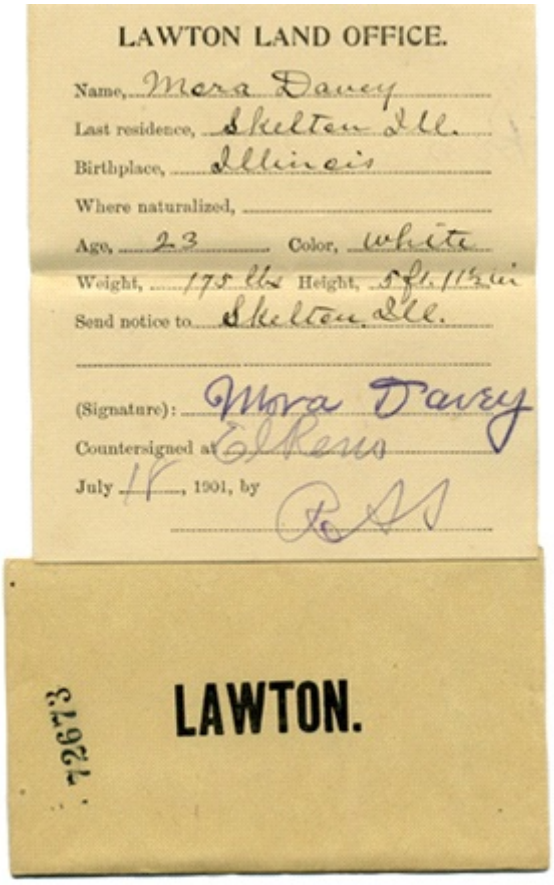


Figure 5.

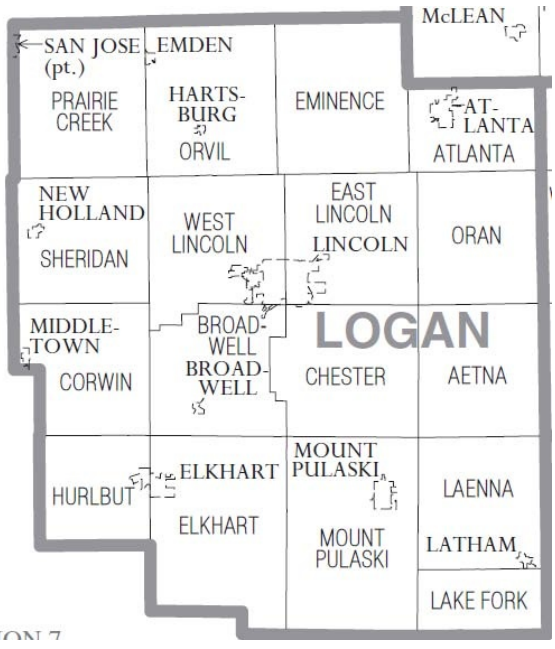


Figure 6.

3.C. Summary Statistics and Balancing Tests

One of the advantages of the wealth shocks generated by both the 1832 and 1901 land lotteries is the presumption that these shocks were orthogonal to individuals' characteristics that would otherwise be associated with higher levels of wealth. In order to

provide a rough test of the exogeneity of the shocks, Table 1 provide some falsification tests. In each case, a pre-lottery outcome is examined as a consequence of either (1) in the Georgia case, winning the lottery rather than merely being in the eligible population as we have defined it but not appearing on the list of winners; or (2) in the Oklahoma case, the order of the individual's draw in the lottery. The outcomes examined for Georgia (Table 1, Panel A) are the individual's age in 1850, the individual's place of birth, the number of children born in the three year window prior to the lottery, the number of letters in the surname (a proxy for the name's uniqueness and consequent ease of matching), and whether the surname began with an "M" or an "O" (a proxy for Irish origin). Of these, only number of letters in the surname is associated with the probability of being a lottery winner rather than in the treatment group only; this reflects the greater ease of linking individuals with longer surnames, but should not be related to any economically-relevant outcomes.

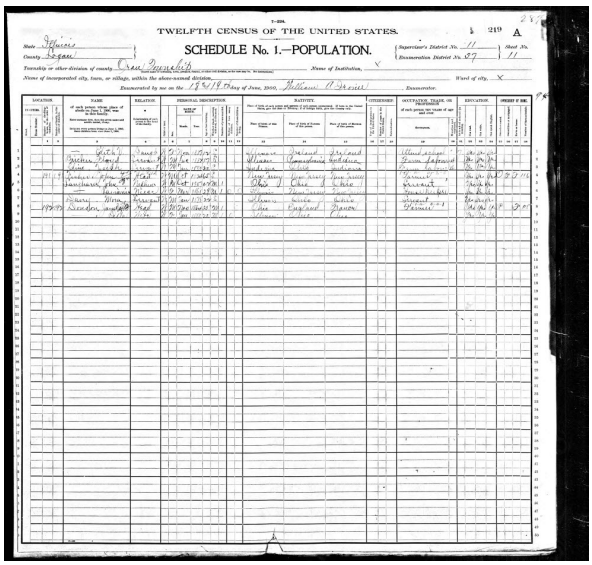


Figure 7.

In the Oklahoma file (Table 1, Panel 2), a different set of outcomes was examined (location, the matching success, and several census characteristics that predate the lottery). Of these, the only significant effects are from surname length (those with later draws also had shorter surnames) and matching to either the 1900 or 1910 censuses (less likely for those with later draws, perhaps because the source we are using was more likely to report initials rather than full first name and middle initial for those with later draws).

4. Results

For the Georgia 1832 lottery, lottery winners were 1.5 percentage point more likely than the control group to reside in 1850 in one of the counties carved out of the Cherokee Land, compared to a baseline probability of 11 percent in the total sample. This was true whether or not controls for age were included. Winners were, however, no more likely to reside in Georgia than the control group. Over the 18 years following the lottery, winners had between 5 percent (with age controls) and 6 percent (without age controls) more children than the control group. Winners were also slightly more likely to be married by 1850 (2 percentage points compared to the sample mean of 81 percent), though this effect is not statistically significant when age controls are introduced. The effect on marital status must come through improved survival for the spouse or through improved remarriage prospects for winner, as the treatment and control groups were both already married at the time of the lottery – recall that both groups were selected on the basis of the presence of children born in the three years before the lottery.

Perhaps surprisingly, the Georgia lottery winners were only $62 wealthier in 1850 than the control group, and even this small effect cannot be statistically distinguished from zero. No substantial effect of winning the lottery results if we instead examine the natural log of wealth or the probability that a positive amount of wealth was reported. When set against the average 1850 value of a 160 acre farm in the ten Cherokee counties, the impact of winning a plot in the lottery seems quite small. Several mechanisms could have attenuated the effect of winning on wealth, however. One is the possibility that winners (more so than the control group) used the proceeds from the sale of their winning plot to finance either improvements to their existing farm or the purchase of slaves to be used on their existing farm; neither of these outcomes would show up in real estate wealth. A second possibility is that many of the most cash-strapped winners sold their winning plots for a

small fraction of their NPV in the 6 years before the title to the land was finally settled in 1838; in the absence of a well-functioning credit market, the gap between the 1850 value of a plot and the price for which it was sold before 1838 may have been substantial. If this was the case, much of the value of a winning draw would have been dissipated among non-winners with sufficient capital to buy a winning plot and speculate on its value rising when the Cherokee were finally evicted in 1838. Finally, the other results in Panel A of Table 2 show other channels through which lottery winnings could have been spent before showing up in reported real estate wealth in 1850: larger family sizes and improved survival of the spouse or remarriage prospects.

The Oklahoma results are similar to the Georgia results in that better draws in the lottery had a lasting impact on location decisions: those who drew their plots earlier were more likely to remain in southwest Oklahoma (and were also more likely to remain in Oklahoma more generally if the natural log of the lottery drawing position is used). Unlike the Georgia winners, those with better Oklahoma draws were not noticeably more like to expand their families after the lottery than those with worse draws: though better draws were associated with more children born 1901-10, this effect was not statistically significant. The sample size on which these estimates are based (529 observations likned from the winners list to the 1900 census and then to the 1910 census) is quite small. We are in the process of increasing its size. We are also adding the winners from the El Reno site, which by itself will double the number of winners whose outcomes we can observe.

5. Conclusions

Land lottery winners in Georgia (1832) were more likely than non-winners to remain in the locations where they won land; winners of better plots in Oklahoma (1901) were more likely than those with later lottery draws to remain where they settled after the lottery. In both states, the shock

to wealth from the lottery was associated with more rapid family size growth after the lottery, though this effect was statistically significant only in Georgia. Finally, the effect of lottery winnings on wealth on reported 1850 real estate wealth was muted in Georgia: the point estimate of a $62 advantage for winners over the control group was both small in magnitude (compared to the $900 value of a 160 acre farm in the ten counties where land was distributed) and statistically insignificant.

We are presently at work to expand the samples in two dimensions: (1) adding additional observations to the Oklahoma data by incorporating the El Reno lottery site winners and searching manually in the 1910 census for additional matches; and (2) adding additional outcomes for both the Georgia lottery (the real estate and personal estate reported for winners and the control group in 1860, children's school attendance and literacy in 1850, and children's own wealth holdings – both real estate and personal estate – in 1860) and the Oklahoma lottery (the occupational attainment and home ownership for the winners themselves, and the child survivorship rates reported by their wives in 1900 and 1910, their children's school attendance and literacy in 1910, and their children's later life outcomes – occupation and home ownership in 1930 and age at death).

6. References

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Table 1. Falsification Tests

Panel A: Cherokee Land Lottery, Georgia, 1832

	Age in 1850	Number of Children Born 1829-32	Born in Georgia	Number of Letters in Surname	First letter of Surname is "M" or "O"
Dependent variable mean,					
(standard deviations),	50.998	1.330	0.495	6.191	0.102
and [number observations]	(9.364)	(0.538)	(0.500)	(1.611)	(0.303)
	[15874]	[15874]	[15874]	[15874]	[15874]
Coefficient on lottery winner	0.028	0.004	0.006	-0.071*	0.002
	(0.239)	(0.014)	(0.013)	(0.039)	(0.008)
Coefficient on lottery winner,	---	0.004	0.005	-0.069*	0.002
conditional on age dummies		(0.014)	(0.013)	(0.039)	(0.008)

Panel B: Oklahoma Land Lottery, Georgia, 1901

	Outcomes from list of winners:				Matching outcomes:		Outcomes from 1900 Census:			
Sample	Address in OK	Number of Letters in Surname	Latitude of Origin County	Longitude of Origin County	Matched to 1900 Census	Matched to 1910 Census	Age	Married	Born in OK	Age of Wife
List of winners	0.030	-0.208*	0.068	-0.079	-0.063**	-0.041**				
	(0.034)	(0.116)	(0.184)	(0.156)	(0.029)	(0.018)				
Matched to 1900	0.029	-0.231	-0.228	-0.255		-0.102***	-0.101	-0.077	0.015	
	(0.069)	(0.227)	(0.360)	(0.314)		(0.039)	(1.593)	(0.069)	(0.010)	
Matched to 1910	0.138	-0.130	-0.060	0.200			-1.433	0.020	0.006	-1.692
	(0.121)	(0.404)	(0.569)	(0.601)			(2.819)	(0.090)	(0.011)	(3.235)

Notes: Standard errors in parentheses. Panel B uses lottery number/10000. * p < 0.10 ** p < 0.05 ** p < 0.01

Table 2. Post-Lottery Outcomes

Panel A: Cherokee Land Lottery, Georgia, 1832

	Resides in Old Cherokee County	Resides in Georgia	Number of Children Born 1832-50	Married	Real Estate Wealth (levels)	Real Estate Wealth (logs)	Real Estate Wealth Positive
Dependent variable mean,	0.110	0.728	3.982	0.812	2105	7.117	0.286
(standard deviation),	(0.313)	(0.445)	(2.754)	(0.391)	(6935)	(1.283)	(0.452)
and [number observations]	[15874]	[15874]	[15874]	[15874]	[9506]	[6791]	[9506]
Coefficient on lottery winner	0.015*	0.008	0.239***	0.019**	62.29	0.040	-0.003
	(0.008)	(0.011)	(0.072)	(0.010)	(180.74)	(0.042)	(0.013)
Coefficient on lottery winner,	0.014*	0.007	0.198***	0.015	40.67	0.038	0.002
conditional on age dummies	(0.008)	(0.011)	(0.066)	(0.010)	(185.67)	(0.042)	(0.013)

Panel B: Lawton Land Lottery, Oklahoma, 1901

	Resides in SW Oklahoma	Resides in Oklahoma	Children Born 1901-10
Dependent variable mean,	0.151	0.425	1.132
(Standard deviation),	(0.359)	(0.495)	(1.360)
and [number observations]	[529]	[529]	[529]
Coefficient on lottery number	-0.194**	-0.158	-0.250
	(0.088)	(0.121)	(0.334)
Coefficient on lottery number,	-0.195**	-0.171	-0.327
conditional on age dummies	(0.088)	(0.120)	(0.317)
Coefficient on ln(lottery number)	-0.362**	-0.417**	-0.528
	(0.156)	(0.214)	(0.591)
Coefficient on ln(lottery number),	-0.358	-0.416**	-0.640
conditional on age dummies	(0.156)	(0.212)	(0.559)

Notes: Standard errors in parentheses.Panel B uses lottery number/10000. * $p < 0.10$ ** $p < 0.05$ ** $p < 0.01$