DEMOGRAPHICS OF PAYDAY LENDING IN OKLAHOMA

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1. EXECUTIVE SUMMARY

A recent report on the performance of Oklahoma's payday lending industry indicates that payday lenders charge consumers about 350% APR on a two-week loan in the state (Veritec, 2011). In 2011 the average payday loan amount was $394.22 with average fee of $52.94. With 350 percent APR, payday loans have become the most expensive loans compared to regular bank loans or mortgage loans. Because of its higher APR and other abusive practices, payday lending is characterized as a form of predatory lending (Graves and Peterson, 2005). Many studies have shown that payday lenders mostly target younger, lower income, and immigrant/minority populations (Gallmeyer and Roberts, 2009; Melzer, 2011; and Prager, 2009). The industry has also found a profitable customer base among military personnel (Graves and Peterson, 2005).

Through high loan fees and other abusive tactics the industry extracts a sizeable portion of disposable income and wealth from economically vulnerable communities. In this report we try to identify the demographic and economic characteristics that attract payday lenders. By using spatial research tools such as ArcGIS we are able to demonstrate that most of the payday lenders (199 out of 324) in Oklahoma are located within a 10-mile radius of military installations and bases. We were able to determine the level of concentration of payday lenders around military installations by spatially joining the national military installations and bases shape file and the census tract shape file of the state of Oklahoma. We then employed the means test and logistic regression methods to identify the demographic and economic factors that attract payday lenders to a neighborhood. Our results are summarized and presented in Tables 1-4 and Figures 1-16. Tables 1-4 show that payday lenders target economically distressed communities in Oklahoma. The census tracts with economically vulnerable populations (elderly, young adults, immigrants and lower income) are more likely to be targeted by payday lending stores. Figures 1-16 show that payday lenders are more clustered around Oklahoma City and Tulsa. Table 4 further provides evidence that payday lenders more intensively target the neighborhoods with a higher percentage of economically vulnerable populations. The means test, t-test and F-test employed in Tables 2 and 4 confirm that payday lenders target economically vulnerable communities in Oklahoma, and the intensity of market penetration is even stronger in the census tracts around military installations and bases. In a way, the statistical tests employed in Tables 2-4 provide strong statistical evidence for the visual patterns in Figures 1-16. These maps show that payday lenders are clustered in the census tracts populated mostly by economically vulnerable populations.

2. INTRODUCTION

A recent report on the performance Oklahoma's payday lending industry indicates that payday lenders charge consumers about 350% APR on a two- week loan in the state (Veritec, 2011). In 2011, the average payday loan amount was $394.22 with an average fee of $52.94. With 350 percent APR payday loans have become the most expensive loans compared to regular bank loans or mortgage loans. Because of its higher APR and other abusive practices, payday lending is characterized as a form of predatory lending (Graves and Peterson, 2005). As documented by the literature, payday lenders mostly target younger, lower income, and immigrant/minority populations (Gallmeyer and Roberts, 2009; Melzer, 2011; and Prager, 2009). The industry has also found a profitable customer base among military personnel (Graves and Peterson, 2005).

The most recent report by the Department of Consumer Credit in Oklahoma indicates that there were 324 in-state deferred deposit lenders or payday lenders in Oklahoma (see http://www.ok.gov/okdocc/documents/DDL-OK-2014.pdf). An earlier report (Veritec, 2011) shows that, in October 2011, there were 358 active and registered payday stores in Oklahoma. There is no reliable information on the total number of total active payday lenders because a significant portion of payday lenders are unregistered and states do not regularly gather information even on the registered ones (Graves and Peterson, 2005). The emergence of on-line payday lenders has further complicated the issue. Our report is based on the data made available by the Oklahoma Department of Consumer and Credit. Of the 324 payday lending stores in Oklahoma, 59 of them are located in Tulsa and 69 of them are located in Oklahoma City. Tulsa and Oklahoma City are two large population centers in Oklahoma and they account for 128 payday lending stores out of 324. By using the national military installations bases shape file available from the U.S. Census Bureau, we have identified six military installations and bases in Oklahoma. Table 1 presents the number of payday lending stores within 5-mile and 10-mile buffer zones around the six military installations and bases in Oklahoma. Of 324 payday lending stores, 199 of them are located within 10-mile buffer zones around the military installations and bases. Tinker AFB and Fort Sill have the highest number of payday lending stores within the radius of 10-miles.

Table 1 suggests that the majority of payday lending stores are within a 10-mile radius of military installations and bases (199 out of 324). The literature has provided ample evidence that payday lenders target military personnel by opening shops around military installations (Graves and Peterson, 2005). However, some military installations and bases, such as Tinker AFB, are also in the vicinity of large population centers. To control for the effect of population size we use census tract population as an independent variable in our regression analysis.

Payday lenders target certain population groups who are vulnerable because they either do not have access to regular banking services or they are misinformed about the terms and conditions of payday loans (Graves and Peterson, 2005). We employ means test to determine whether census tracts with payday lenders differ from those without payday lenders based on income and demographic factors.

The basic research methods and data will be presented in the next section. The main findings of this report will be discussed in the results and findings section. The summary and conclusion section describes the main results of this report and provides suggestions for future research.

Table 1: Number of Payday Loan Stores

	5-mile Buffer	10-mile Buffer
Altus AFB	3	5
Cp Gruber		2
Ft Chaffee Maneuver Training Center		1
Ft Sill	23	27
McAlester Army Ammunition Plant		6
Tinker AFB	43	151
Vance AFB	4	7
Total	73	199

3. METHODOLOGY AND DATA

To study the demographic composition of census tracts with and without payday/deferred deposit lenders, we have combined census tract level demographic and economic data from the U.S. Census Bureau with census tract level information on payday lenders in Oklahoma. We used 5-year estimates for 2012 from the American Community Survey. We obtained data on active payday lending stores from the Department of Consumer Credit in Oklahoma. The Department of Consumer Credit posted the addresses of the 324 in-state deferred deposit lenders on its website (see http://www.ok.gov/okdocc/documents/DDL-OK-2014.pdf). Of the 1,046 census tracts in Oklahoma, only 226 census tracts have payday lenders. The number of payday lenders per census tract varies between 0 and 4. The data set on the number of payday lenders is incomplete because the number of active payday lenders is greater than the figure displayed by official statistics. The existence of unregistered payday lenders is well documented in the literature (Graves and Peterson, 2005). Since our data is limited to the registered payday lenders, our analysis is based on an incomplete list of payday lenders in Oklahoma.

Payday lenders do not randomly pick a place to operate. They target certain population groups who are vulnerable because they either do not have access to regular banking services or they are misinformed about the terms and conditions of payday loans (Graves and Peterson, 2005). The literature has provided ample evidence that payday lenders also target military personnel by opening shops around military installations (Graves and Peterson, 2005). We have created a new data set to investigate whether the census tracts around the military installations and bases have a higher concentration of payday lending stores. We retrieved the national military bases and installations shape file from the U.S. Census Bureau and created buffer zones of 5 miles and 10 miles around each base and installation in Oklahoma. Then we spatially joined this map with the census tract shape file map of Oklahoma. Our 5-mile and 10-mile buffers show the number of payday lending stores in each census tract within the buffer zone. We were then able to statistically test whether the census tracts within the buffer zones have a statistically different concentration of payday lenders than those that are away from military bases and installations.

We use the means-test to test whether the census tracts with payday lending stores differ from those without a payday lending store based on demographic and economic variables. We also employ the means-test to investigate whether the census tracts closer to military installations and bases in Oklahoma have higher concentration of payday lenders than those that are further away. We then use logistic regression method to investigate the relationship between various demographic and economic factors and the likelihood of attracting

a pay day lender to a neighborhood. Since our dependent variable takes a value of 0 and 1, the logistic regression method is more appropriate than an ordinary least square (OLS) method. We also created maps to spatially summarize and present our results (Figures 1-16). Table 2 presents the summary of our main variables. On average, about 73 percent of the population was white, 8.3 percent was Native American, 9.19 percent was Hispanic and about 6.7 percent was black in 2012. 226 census tracts or 21.6 percent of census tracts had at least one payday lender in Oklahoma. On average, 12.48 percent of households were female-headed, 4.09 percent of the population over 18 years old was covered by TRICARE or military health coverage, and 3.905 percent of the total population was covered by TRICARE or military health coverage. About 6.9 percent of the census tracts (or 73 census tracts) were within the 5-mile buffer zone and about 6.9 percent of the census tracts (or 199 census tracts) were within the 10-mile buffer zone of the military installations and bases. The average number of payday lending stores per population of 100,000 was about 9.08. This variable measures the concentration of payday lending industry in a neighborhood.

Table 2. Description of Main Variables

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Population	1046	3584.135	1689.823	74	12113
# Payday	1046	0.309751	0.674654	0	4
White Share	1046	0.7288	0.160059	0	0.997927
Black Share	1046	0.083137	0.147059	0	0.96457
Native Am. Share	1046	0.06764	0.064858	0	0.457558
Asian Share	1046	0.016776	0.031281	0	0.335664
Hispanic Share	1046	0.091909	0.118849	0	0.816794
Immigrant Share	1046	0.055565	0.070018	0	0.466321
Payday Dummy	1046	0.216061	0.411753	0	1
60+ Share	1046	0.19.2898	0.659370	0	0.434
Age 20-29 Share	1046	0.144518	0.746692	0	0.707
Female HH	1045	0.124878	0.070064	0	0.735484
TRICARE/Mil.Health Cov.Share, 18+	1045	0.040814	0.062936	0	0.865942
Within 5-mile Buffer	1046	0.06979	0.254914	0	1
TRICARE/Mil.Health Cov.Share, All	1045	0.039059	0.066728	0	0.900259
Within 10-mile Buffer	1046	0.190249	0.392685	0	1
# Payday Store/100,000 pop.	1046	9.087201	22.01006	0	233.508

4. RESULTS AND FINDINGS

The means test statistics presented in Table 3 indicate that the census tracts with payday lenders differ from those without payday lenders based on income, immigrant population share, share of younger adults as household heads, and share of female-headed households. We also tested for whether the census tracts with payday lenders have different means than those without payday lenders along dimensions such as black population share, Hispanic population share, Native American population share and population share of 60+, but we found statistically insignificant t-values, which suggests that these variables do not play roles independent of other demographic variables such as immigrant share and female-headed household share. Our preliminary conclusion, based on the means-test, shows that the census tracts with at least one payday lender differ from those without a payday lender along the following dimensions: median income, immigrant population share, share of younger adults as household heads, and share of female-headed households.

As demonstrated by Table 1 most of the paydays lending stores are located within a 10-mile radius of military installations and zones in Oklahoma. We created an indicator of payday lending concentration by dividing the number of payday lending stores by census tract level population. We then multiplied this by 100,000 to find the number of payday lending stores per population of 100,000. This variable has been used in the literature to measure the variation in concentration or penetration of payday lending industry across neighborhoods. We then employed the means test to investigate whether the census tracts within a 10-mile radius of military installations and bases differ in terms of the number of payday lending stores per 100,000. We found that the average number of payday lending stores per 100,000 was 11.95 in the census tracts within the 10-mile buffer zones and 8.41 in the census tracts that were away from the 10-mile buffer zones. The t-value that tests for the differences in the two mean values was -2.04. The t-value was significant at 5 percent. Therefore, we can conclude that the census tracts within a 10-mile radius zone had a higher concentration of payday lending stores than those that are farther away.

Figures 1-16 illustrate the number of payday lending stores against census tract level demographic and economic variables. The concentration of payday lending stores in lower income and immigrant neighborhoods is more visually clear in Tulsa and Oklahoma City. Figures 1-16 also indicate the higher concentration of payday lending stores in Oklahoma City and Tulsa.

Table 3: Means Test for Census Tracts with/without Payday Lending Store

	Census Tract (N)	Median Income (Mean)	Immigrant Share	Household Head Age (20-29) Share	Female Headed Household Share
Payday Lender (No =0)	818	$ 47,765	5.30%	14.01%	12.10%
Payday Lender (Yes = 1)	226	$42,517	6.47%	16.05%	13.87%
		diff = mean(0) - mean(1), t =3.56 P (means are not equal) = 0.0004	diff = mean(0) - mean(1) t = -2.22 P (means are not equal) = 0.0269	diff = mean(0) - mean(1) t = -3.65 P (means are not equal) = 0.0003	diff = mean(0) - mean(1) t = -3.38 P (means are not equal) = 0.0008

To determine the factors that increase or decrease the likelihood of attracting a payday lender to a census tract we employ logistic regression analysis. Since our dependent variable takes a value of 0 or 1, the Ordinary Least Square (OLS) method is not appropriate. Instead we use logistic regression method in which the estimated regression coefficients measure whether the independent variables are positively or negatively related to the likelihood of attracting a payday lender. Additionally, we can control for correlations among the independent variables. For example, some military bases are located in higher population areas. To control for the population effect, we include census tract level population as a control variable in our regressions. Similarly, the median household income and the population share of female-headed households are correlated. The estimated correlation coefficient is -0.48. When we include both of these variables in the regression, the estimated coefficient of the logarithm of median household income became insignificant. The census tracts with a high share of female-headed households also tend to be lower income neighborhoods. Table 4 presents the results of our logistic regressions.

The logistic regression results presented in Table 4 help us to identify the factors that attract payday lenders to a census tract. It shows that the likelihood of attracting a payday lending store is positively related to the share of younger and older households. The logarithm of census tract population has a positive and significant coefficient. It shows that as the census tract population grows, it attracts more payday lenders. This variable also plays a control variable role for the within 5-mile or 10-mile buffer zone variables. The coefficient of within 5-mile variable has 4 percent significance level. When we included the within 10-mile buffer zone variable, we observed that this variable is also positively related to the dependent variable and it was significant at the 5 percent level. The positive and significant coefficients of the within 5-mile or 10-mile buffer zone variables indicate that payday lenders are attracted to the census tracts around the military installations not merely because some of them happen to be located in large population centers. Since we already include the logarithm of population as an independent variable, we can conclude that the industry targets these areas because it finds them more profitable. Graves and Peterson (2005) have also provided empirical support for this hypothesis.

Table 4 shows that a rise in the share of older households (60 years and over) and younger households (ages 25-29 years) increases the likelihood of getting a payday lender. Similarly, an increase in the share of female headed households (sharefemhh) and the share of immigrant population increase the likelihood of getting a payday store. We also added the share of population that receives TRICARE or military health benefit (sharemillall) as proxy for the share of reserve, active and retired military personnel. The coefficient of this variable has a negative sign and the coefficient of within 5-mile or 10-mile buffer zone variable has positive sign. It seems like not all military related personnel are equally targeted by payday lenders. The positive and

significant coefficient of within 5-mile and 10-mile suggest that the industry focuses more on active military personnel. However, finding a better measure of the share of active military personnel is a challenge. By creating 5-mile or 10-mile buffers around military installations and bases we were able to document that payday lenders are disproportionally concentrated in the census tracts closer to military installations and bases in Oklahoma. We also included dummy variables for Tulsa and Oklahoma City in the logistic regressions. We did not obtain statistically significant coefficients for these variables. The higher concentration of payday lenders in Oklahoma City and Tulsa is due to the fact these cities have a higher share of immigrant population, female-headed households, younger and older households.

Tables 1-4 show that payday lenders target economically distressed communities in Oklahoma. The census tracts with economically vulnerable populations (elderly, young adults, immigrants and lower income) are more likely to be targeted by payday lending stores. Figures 1-16 show that payday lenders are more clustered around Oklahoma City and Tulsa. We show that the relationship between the likelihood of attracting payday lenders and the share of economically vulnerable populations is statistically significant. Note that t-statistics for all independent variables have a significance level of 96 percent or higher. Table 4 further provides evidence that payday lenders more intensively target the neighborhoods with a higher percentage of economically vulnerable populations. The means test, t-test and F-test employed in Tables 2 and 4 confirm that payday lenders target economically vulnerable communities in Oklahoma and the intensity of market penetration is even stronger in the census tracts around military installations and bases. In a way the statistical tests employed in Tables 2-4 provide statistical evidence for the visual patterns in Figures 1-16. These maps show that payday lenders are clustered in the census tracts populated mostly by economically vulnerable populations.

Table 4: Factors that Increase the Likelihood of Attracting Payday Lenders in Oklahoma (Logistic Regression Output)

Logistic regression Number of observation= 1045

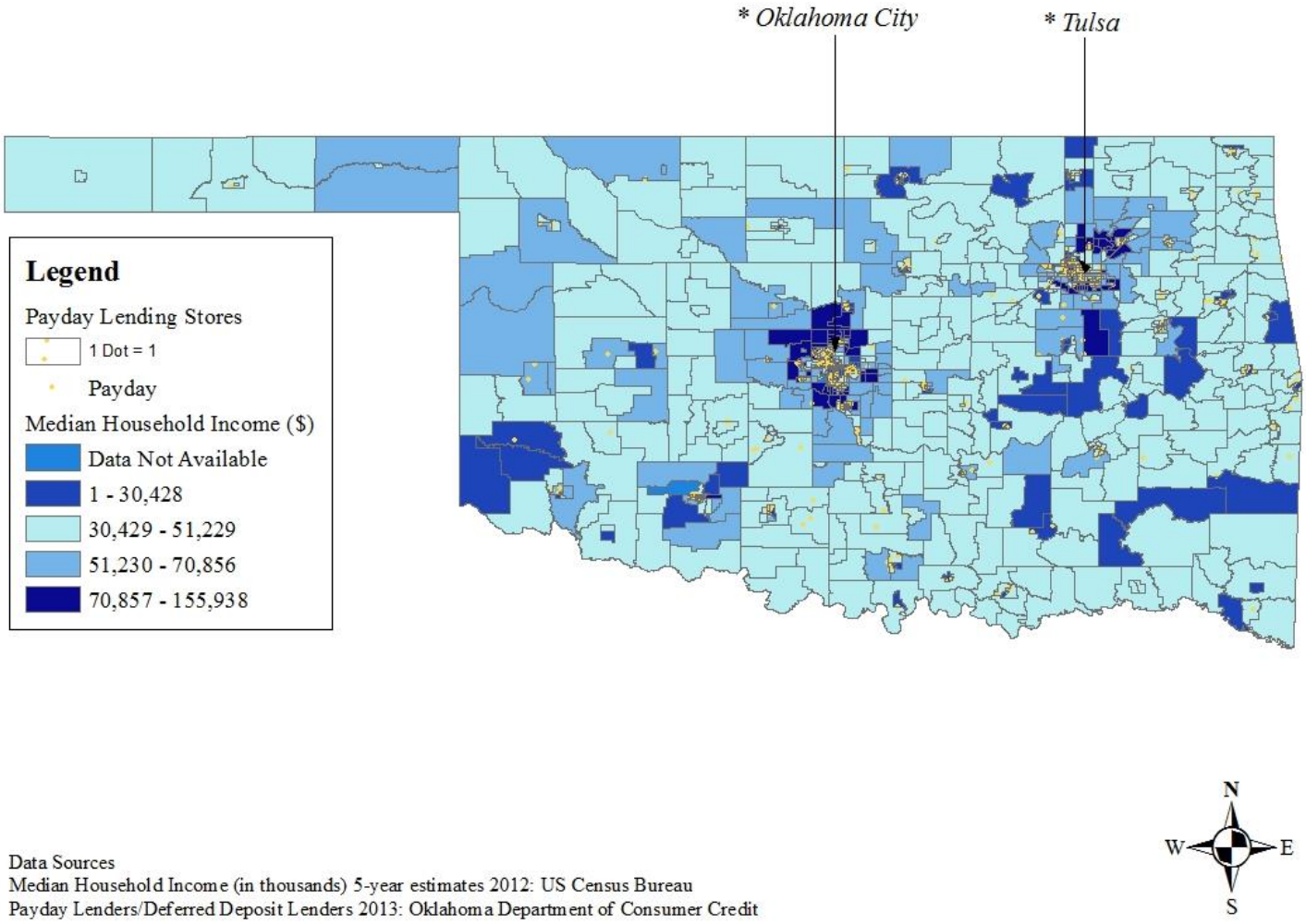
LR chi2(5) = 84.37

Prob > chi2 = 0.0000

Log likelihood = -512.29816 Pseudo R2 = 0.0773

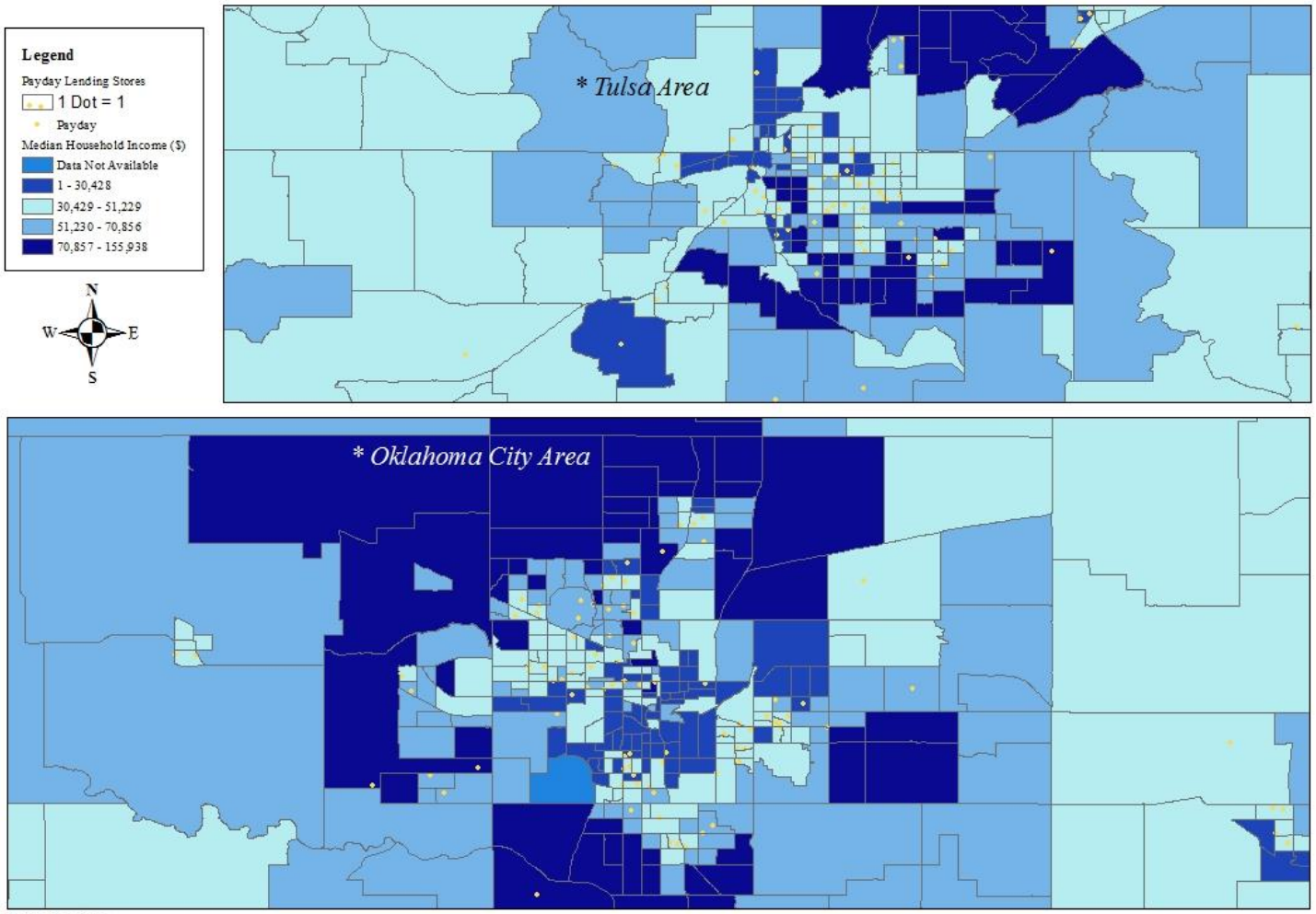
Probability (PaydayStore)	Odds Ratio	Standard Error.	z	P>|z|	[95% Confidence	Interval]
Log pop	2.931865	0.522319	6.04	0	2.06776	4.157074
age20-29 share	1.070338	0.013639	5.33	0	1.043937	1.097406
60andover share	1.078105	0.017283	4.69	0	1.044757	1.112518
Immigrant share	12.54316	14.9142	2.13	0.033	1.219839	128.9768
sharefemhh	103.6382	126.5188	3.8	0	9.470995	1134.081
sharemillall	0.021553	0.037208	-2.22	0.026	0.000731	0.635262
Within 5-mile buffer	2.059534	0.72373	2.06	0.04	1.034315	4.100956

Figure 1: Dispersion of Payday Lending Stores by Median Household Income and Census Tract



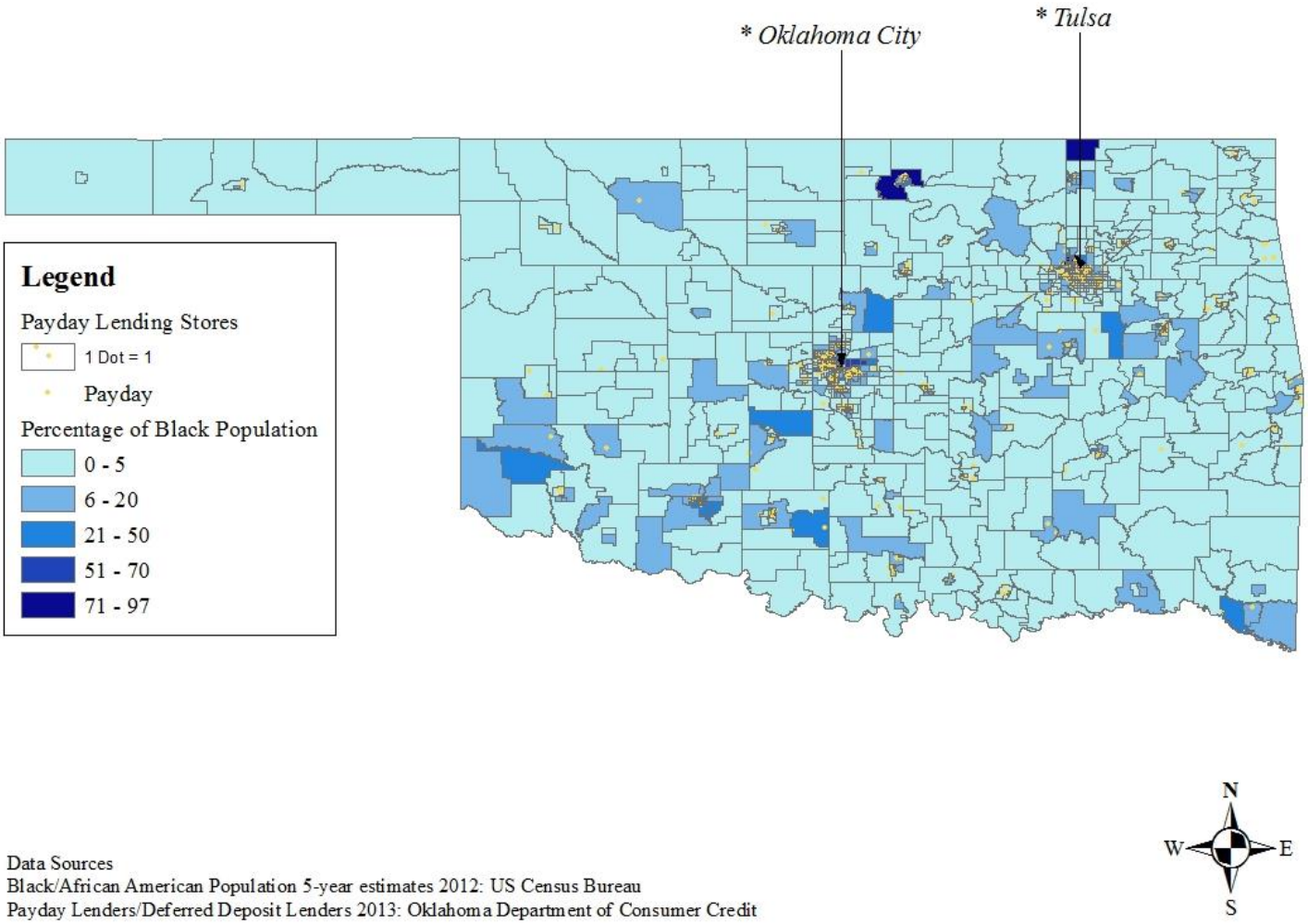
Data Sources
Median Household Income (in thousands) 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 2: Dispersion of Payday Lending Stores by Median Household Income and Census Tract Zoom



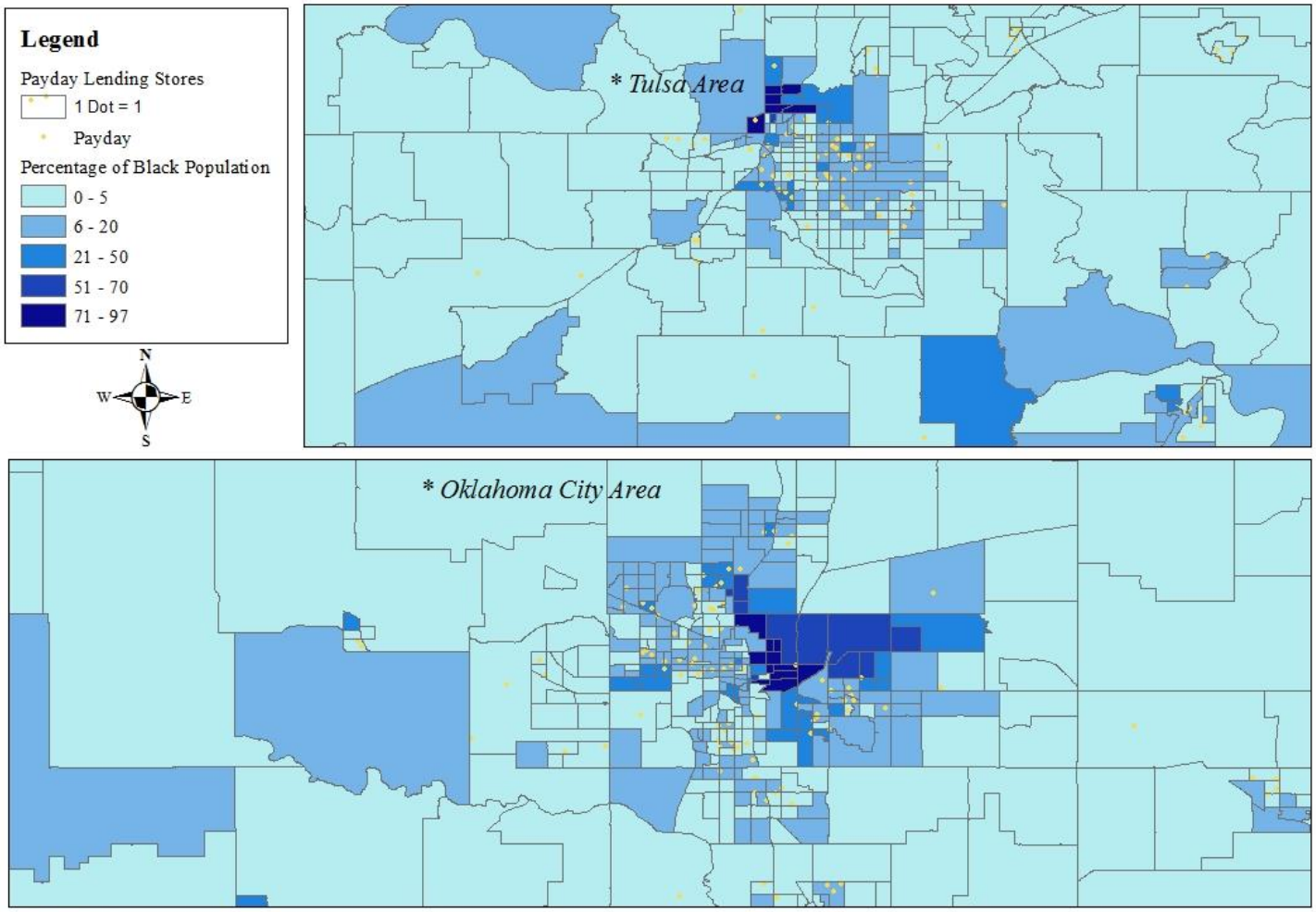
Data Sources
Median Household Income (in thousands) 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 3: Dispersion of Payday Lending Stores by Black Share and Census Tract



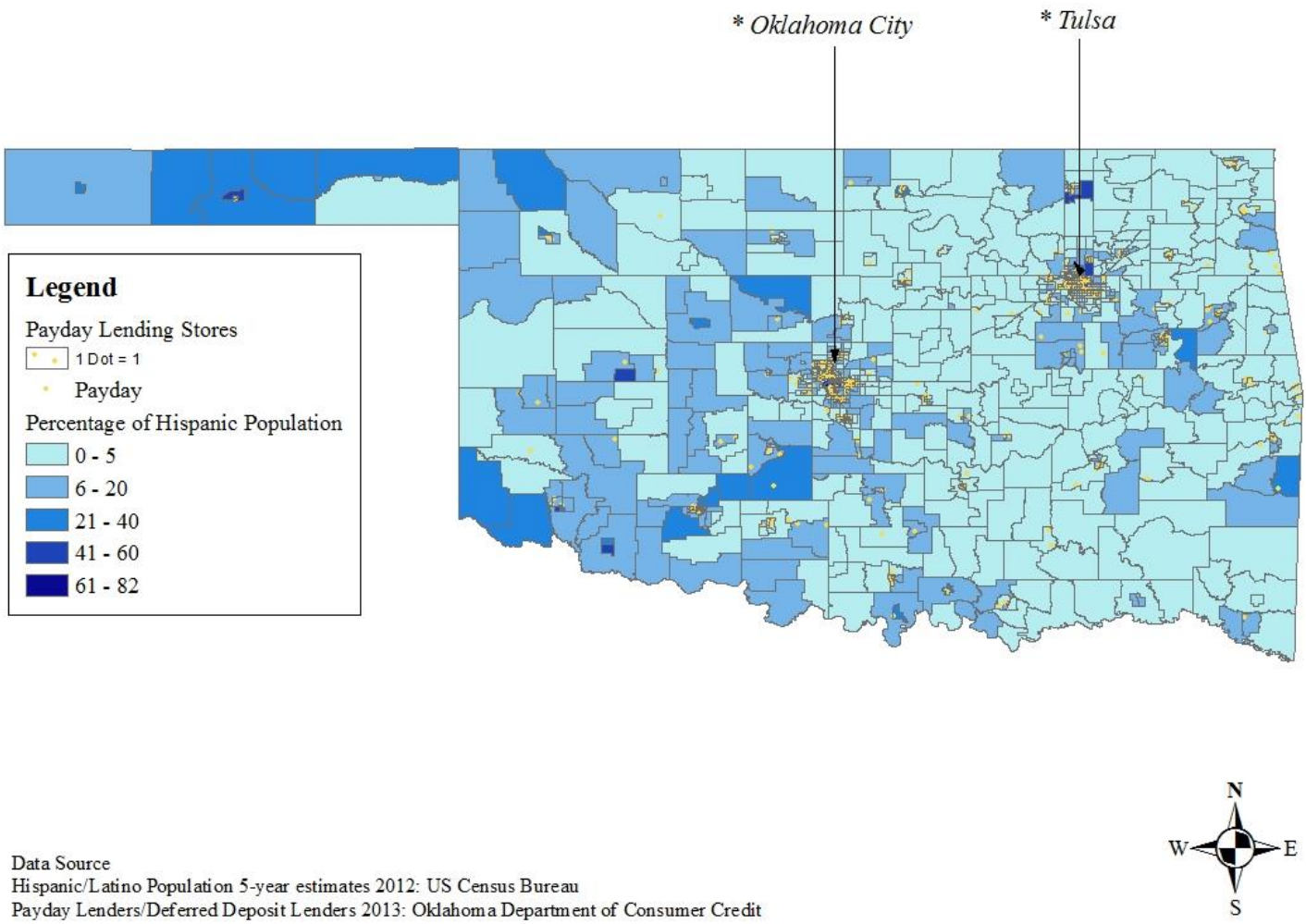
Data Sources
Black/African American Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 4: Dispersion of Payday Lending Stores by Black Share and Census Tract Zoom



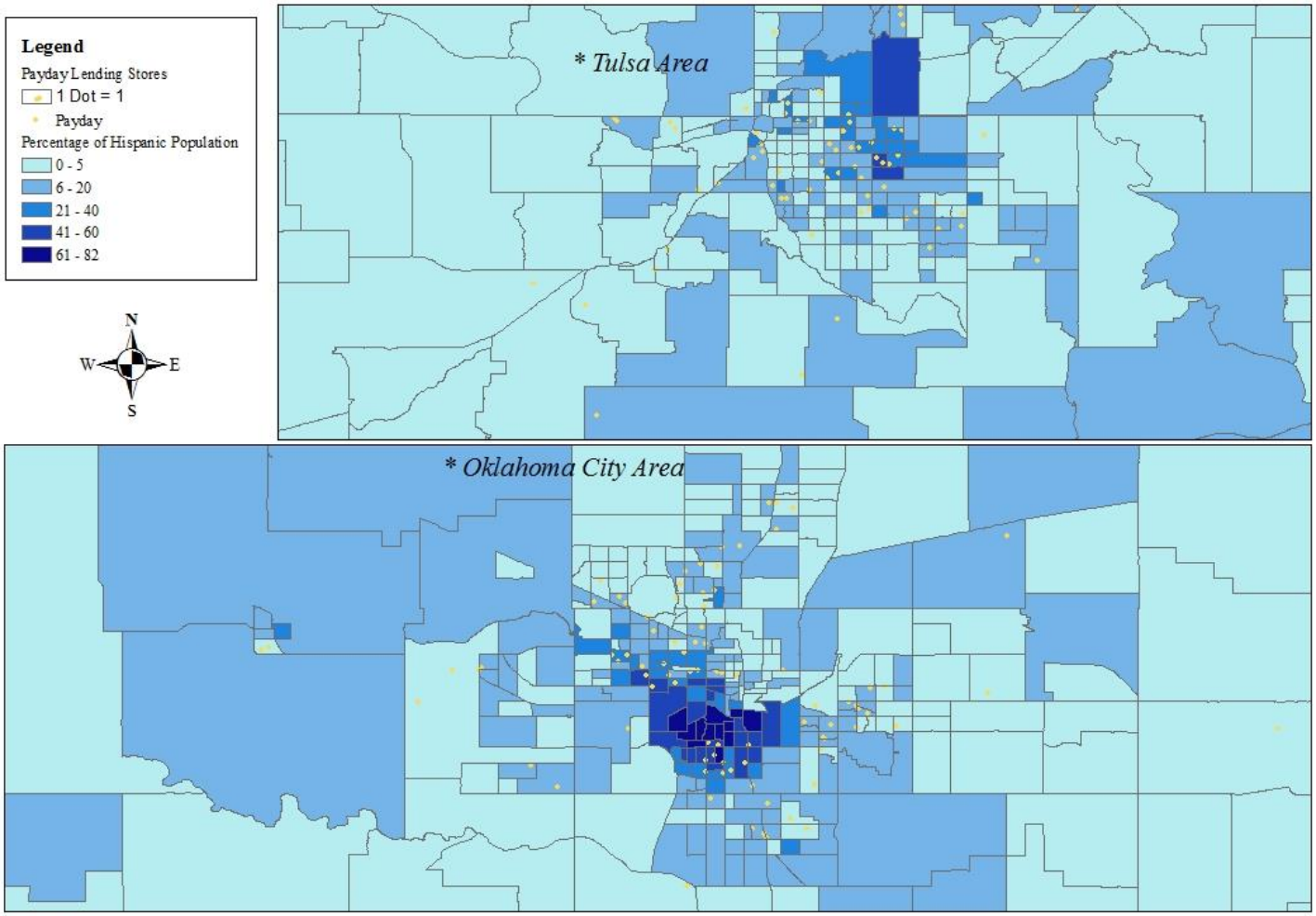
Data Sources
Black/African American Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 5: Dispersion of Payday Lending Stores by Hispanic Share and Census Tract



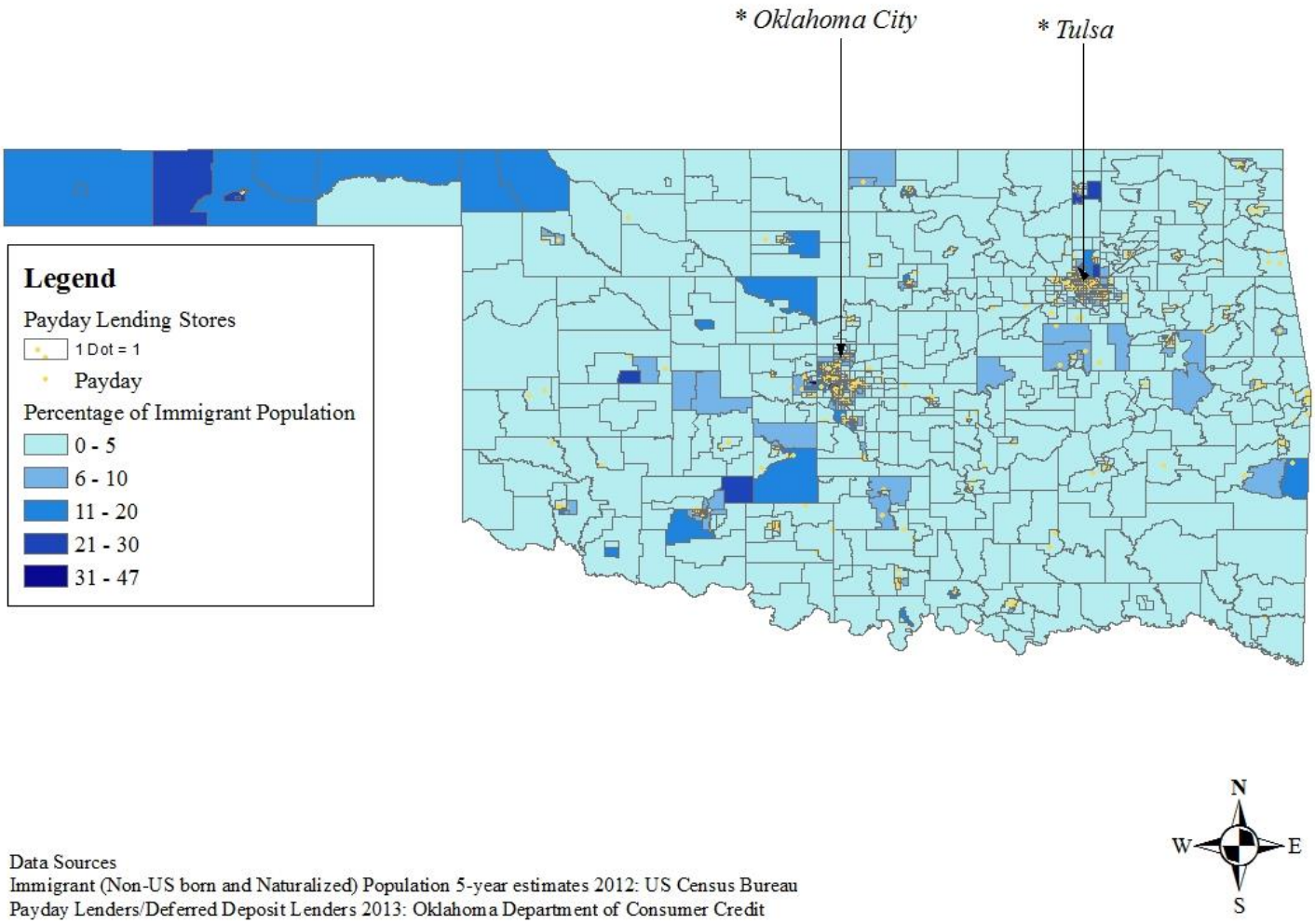
Data Source
Hispanic/Latino Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 6: Dispersion of Payday Lending Stores by Hispanic Share and Census Tract Zoom



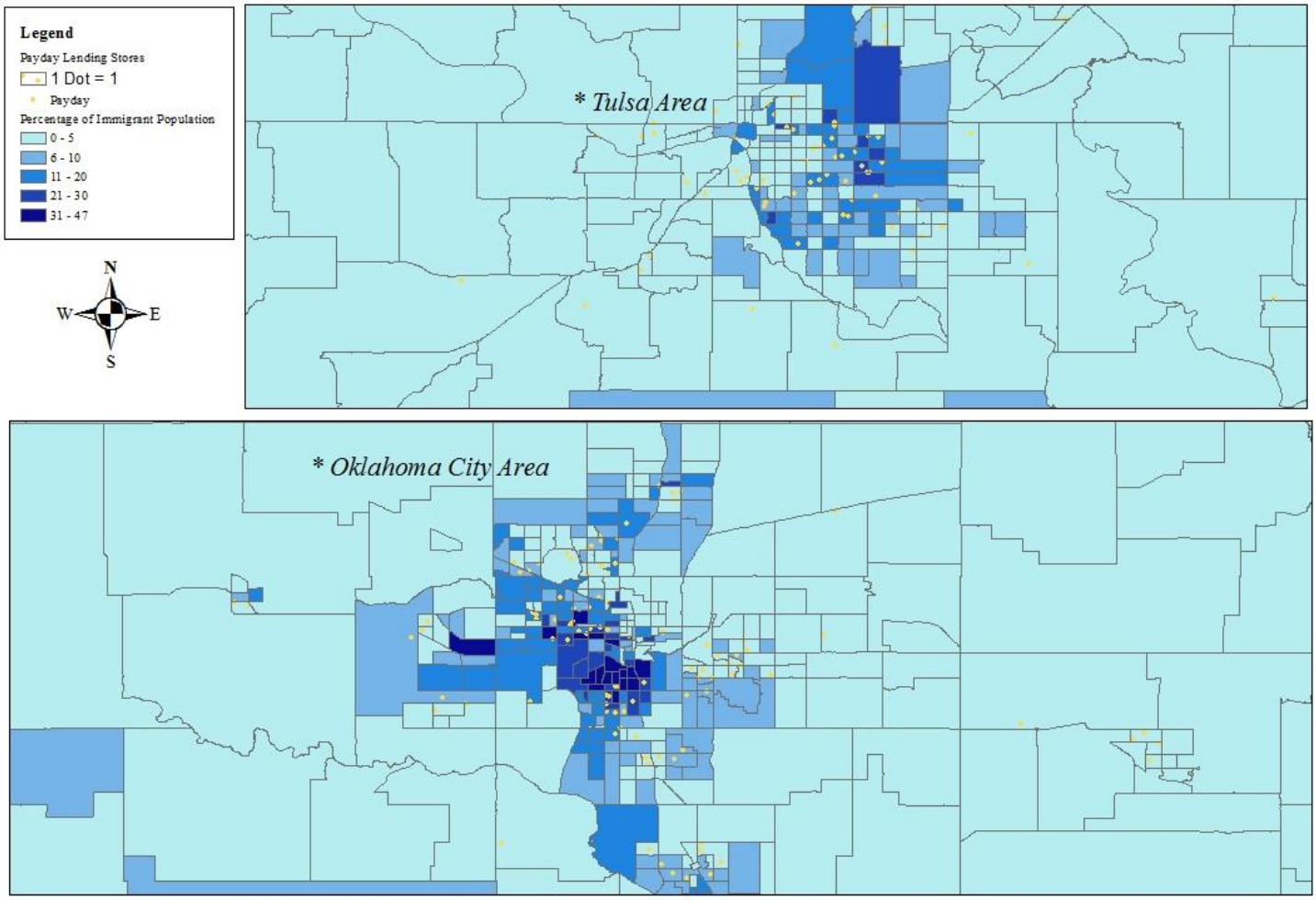
Data Sources
Hiapanic/Latino Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 7: Dispersion of Payday Lending Stores by Immigrant Share and Census Tract



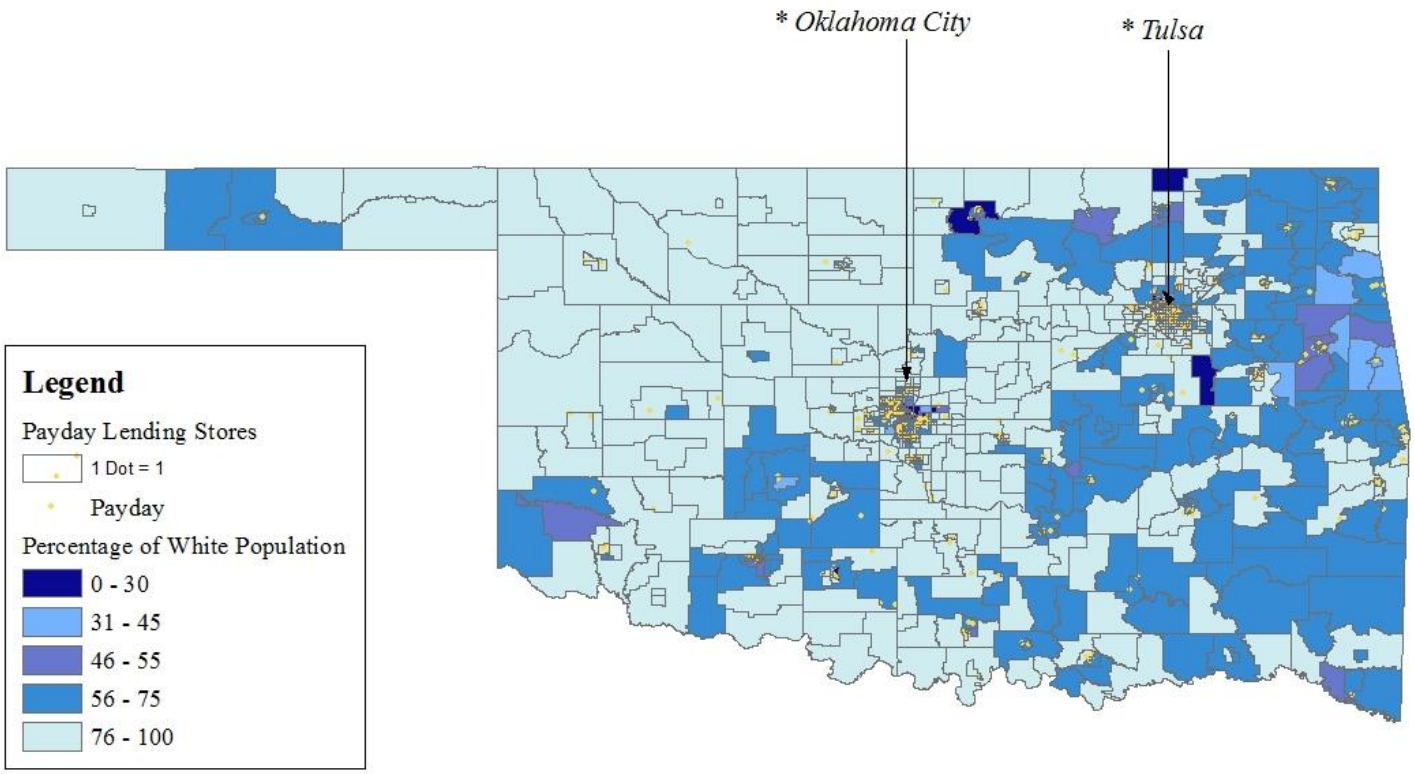
Data Sources
Immigrant (Non-US born and Naturalized) Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 8: Dispersion of Payday Lending Stores by Immigrant Share and Census Tract Zoom



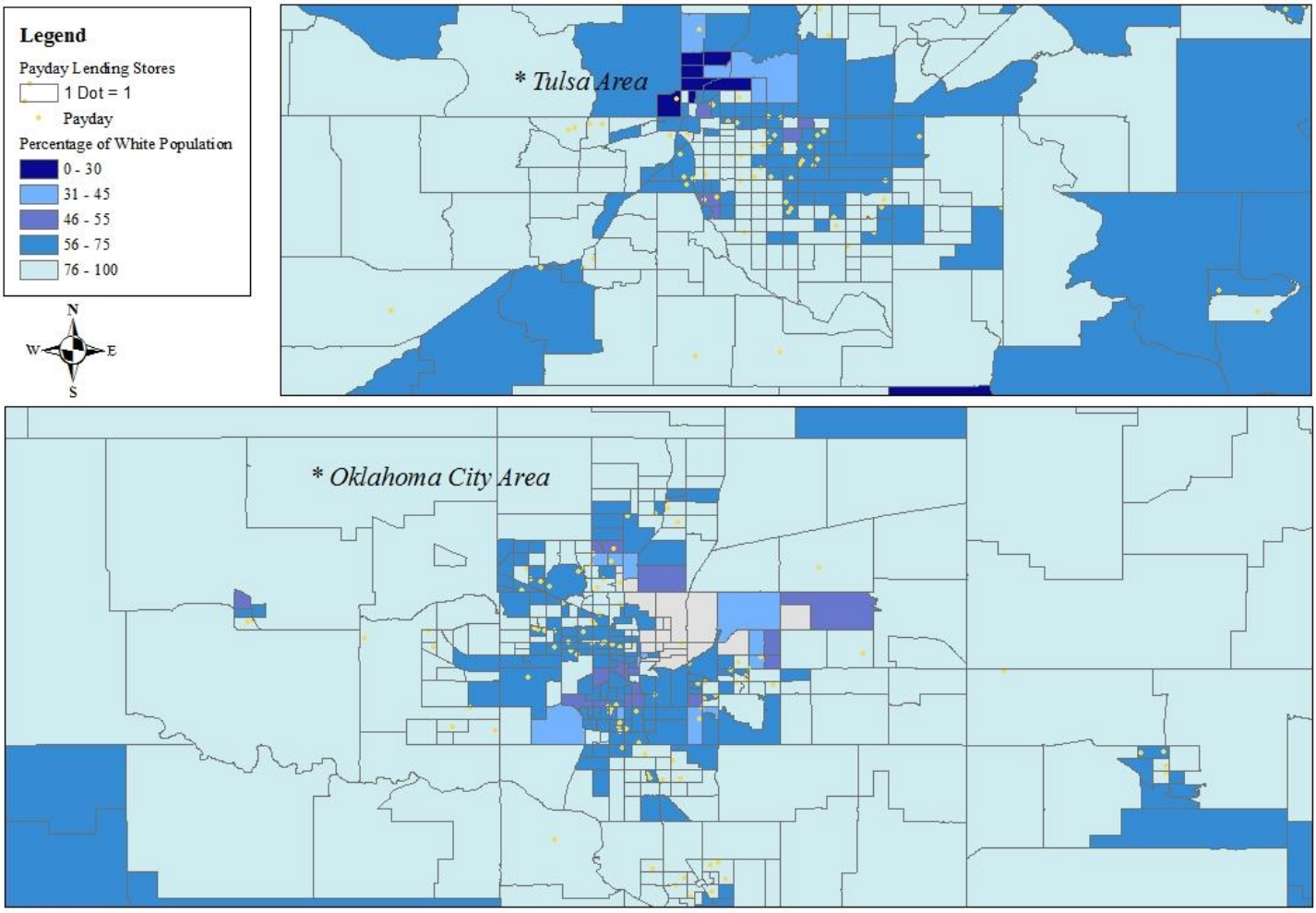
Data Sources
Immigrant (Non-US born and Naturalized) Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 9: Dispersion of Payday Lending Stores by White Share and Census Tract



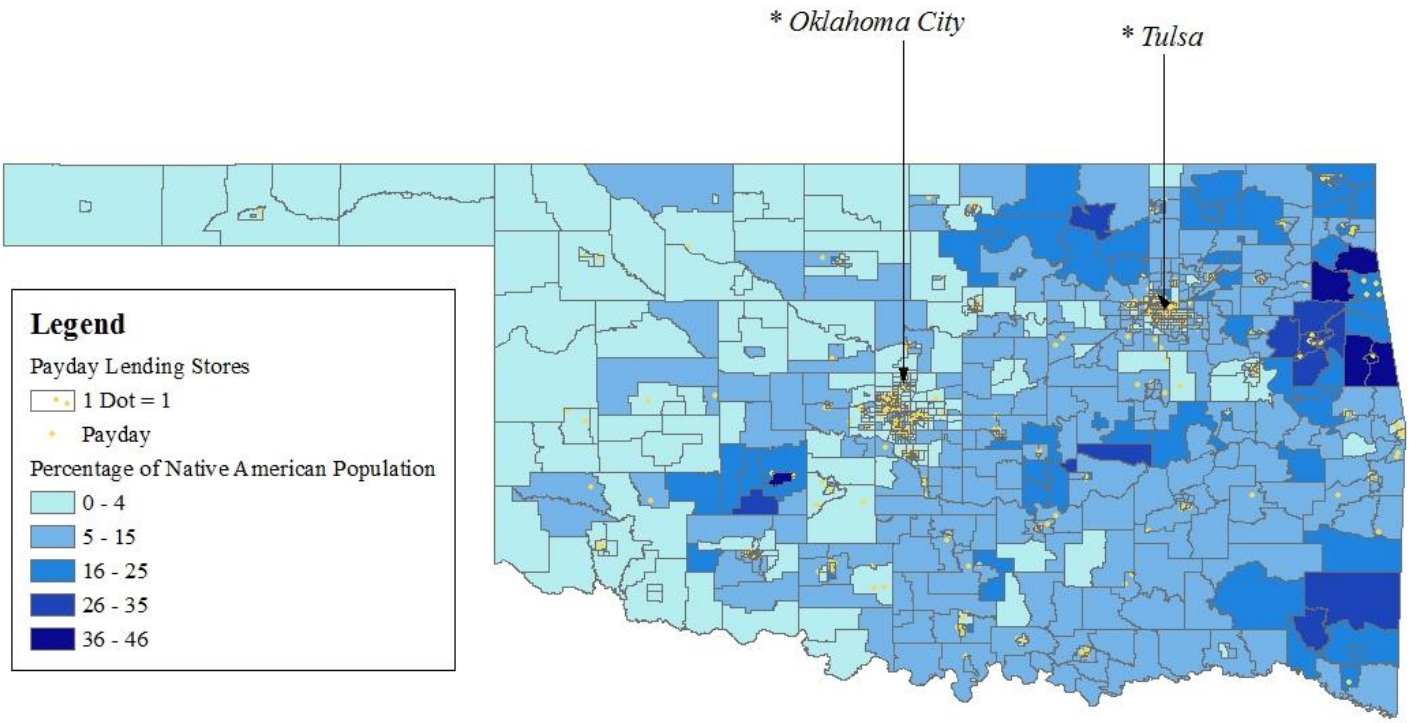
Data Sources
White Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 10: Dispersion of Payday Lending Stores by White Share and Census Tract Zoom



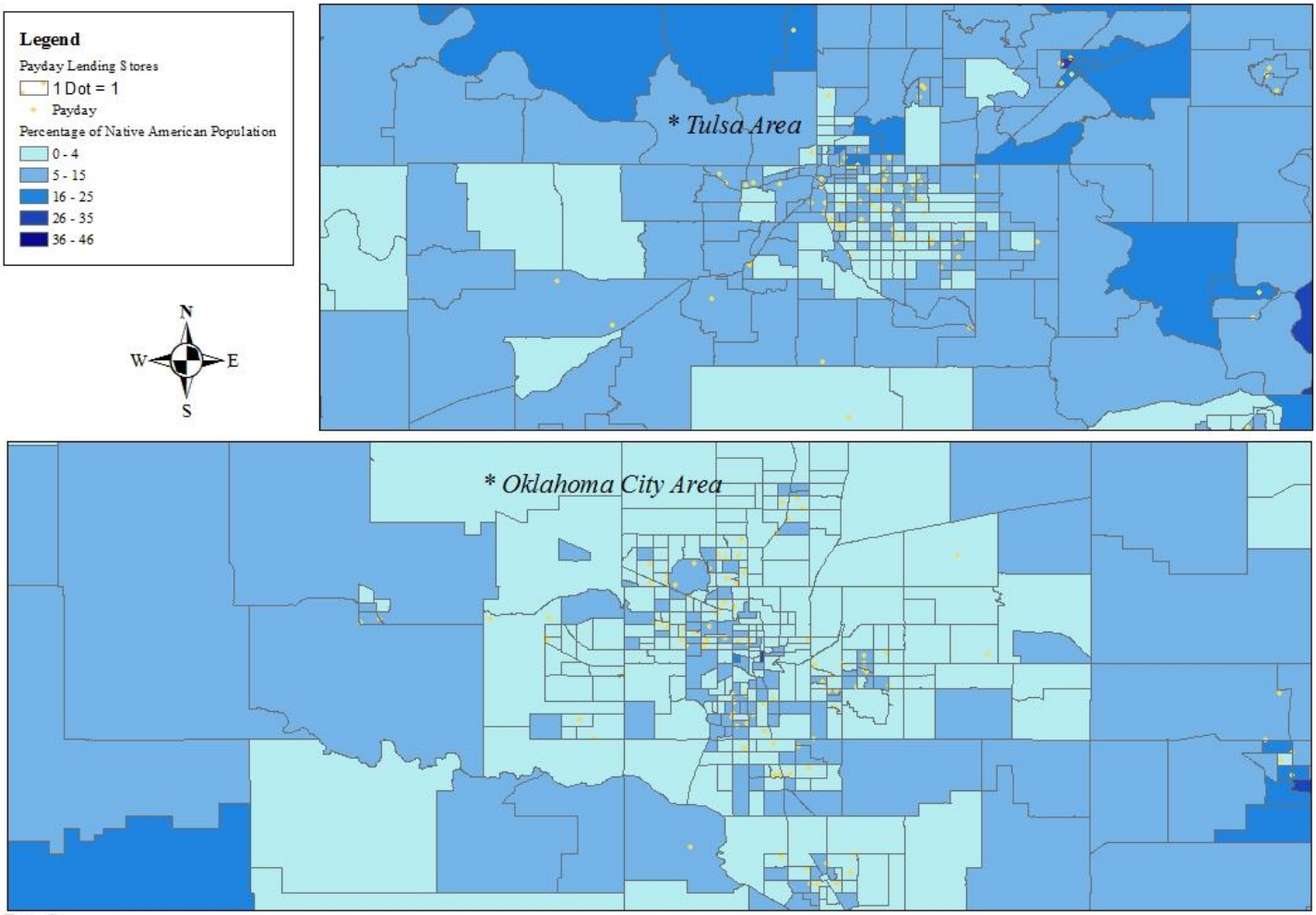
Data Sources
White Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 11: Dispersion of Payday Lending Stores by Native-American Share and Census Tract



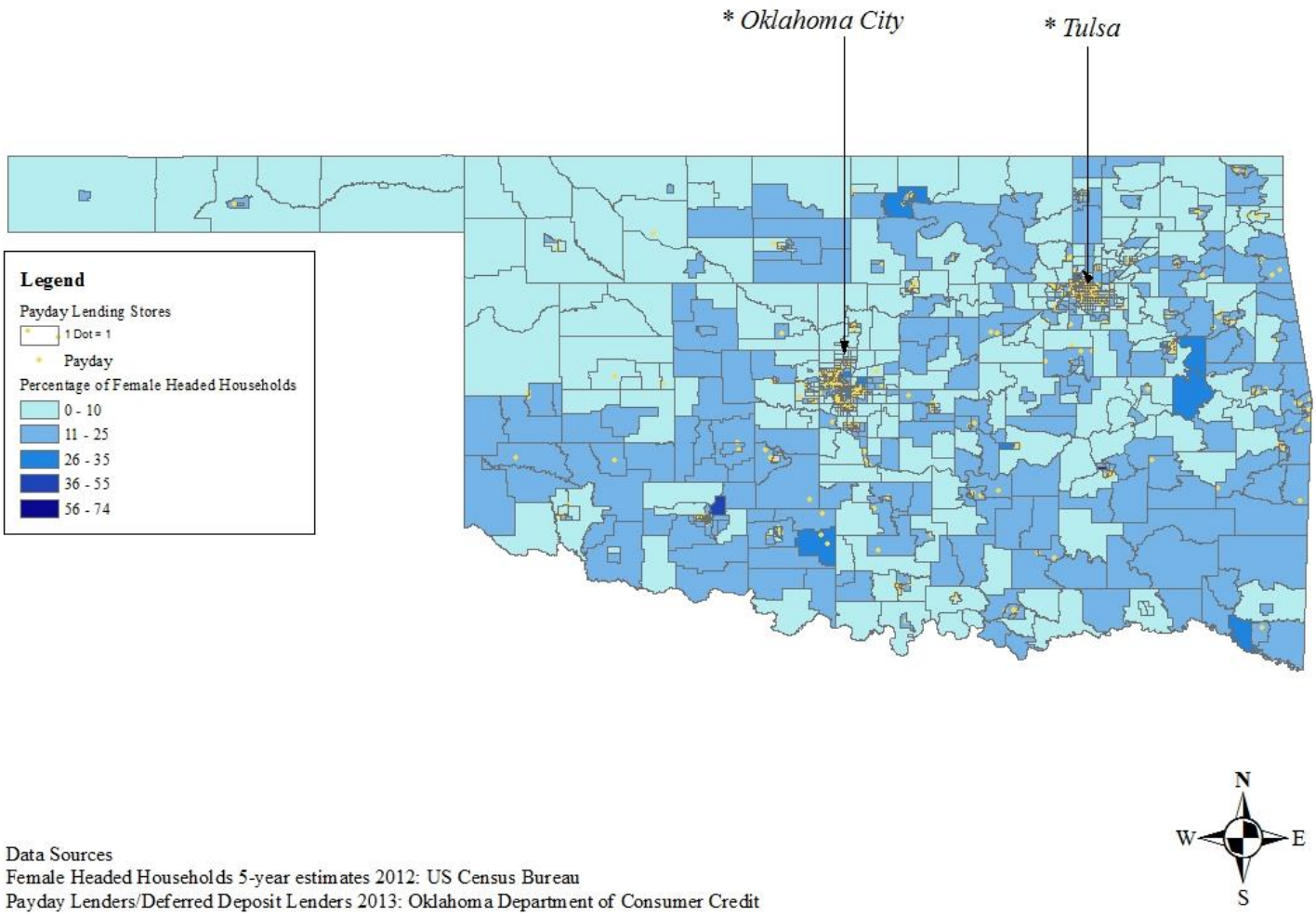
Data Sources
Native American Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 12: Dispersion of Payday Lending Stores by Native-American Share and Census Tract Zoom



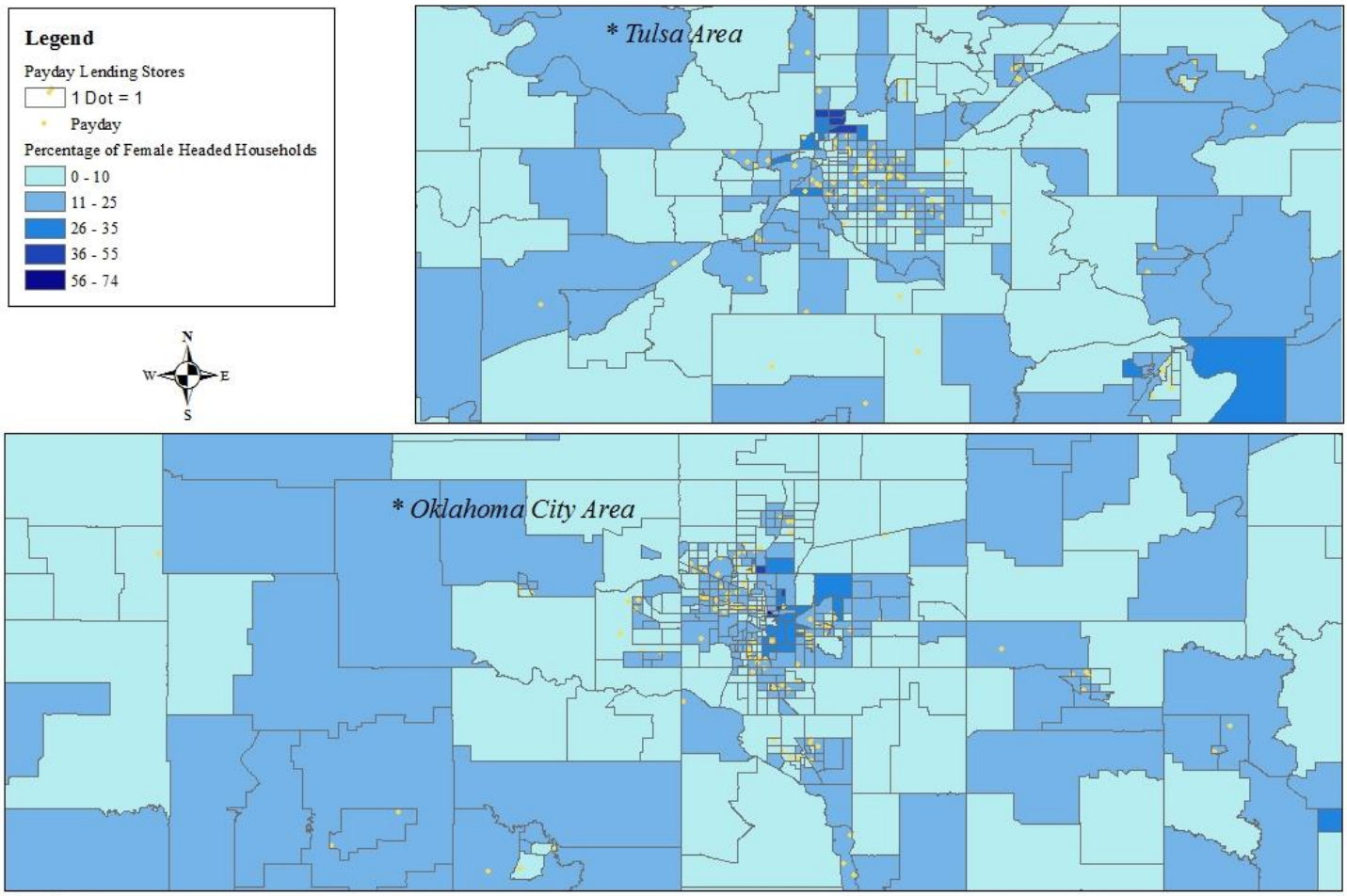
Data Sources
Native American Population 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 13: Dispersion of Payday Lending Stores by Female Headed Household Share and Census Tract



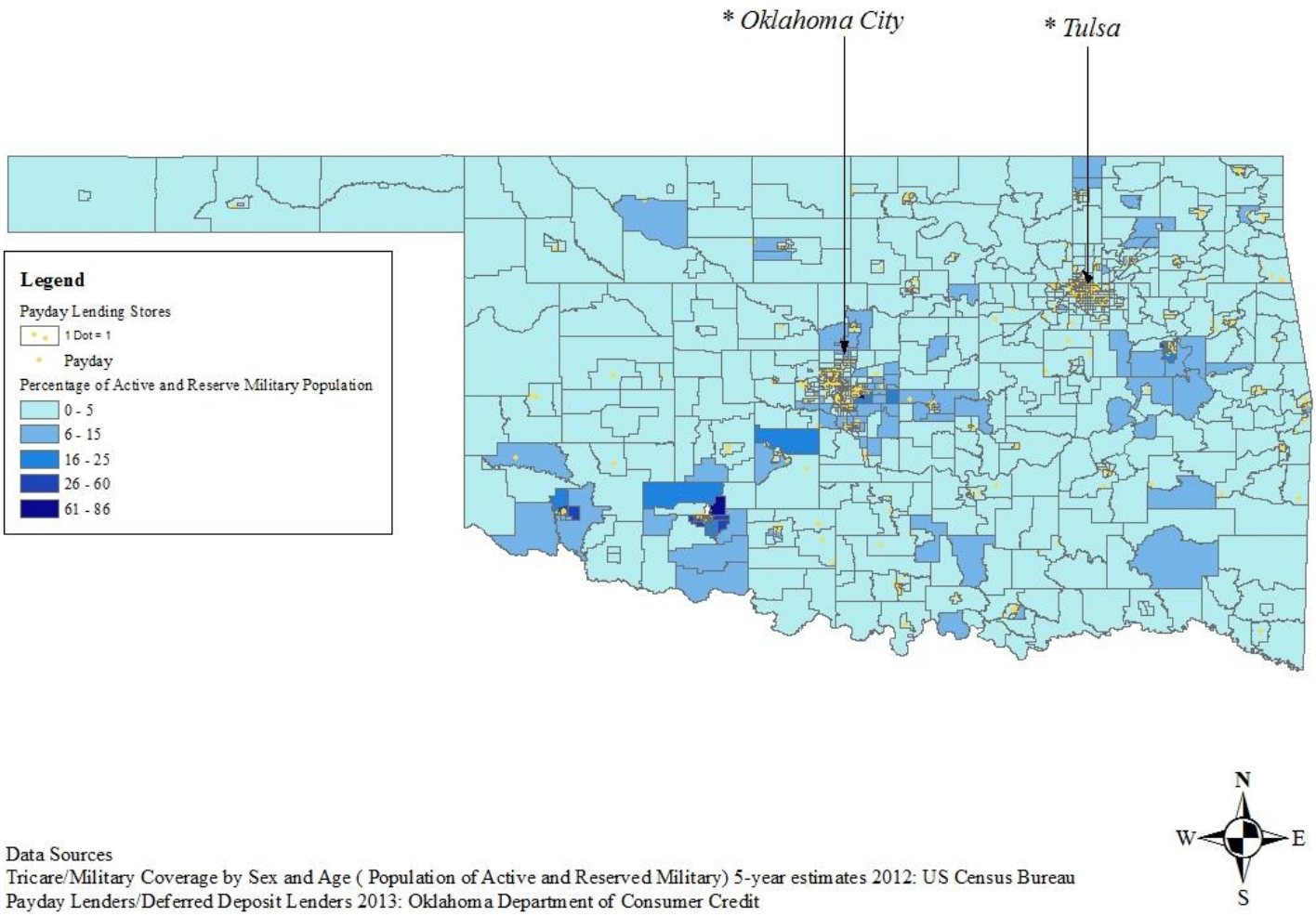
Data Sources
Female Headed Households 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 14: Dispersion of Payday Lending Stores by Female Headed Household Share and Census Tract



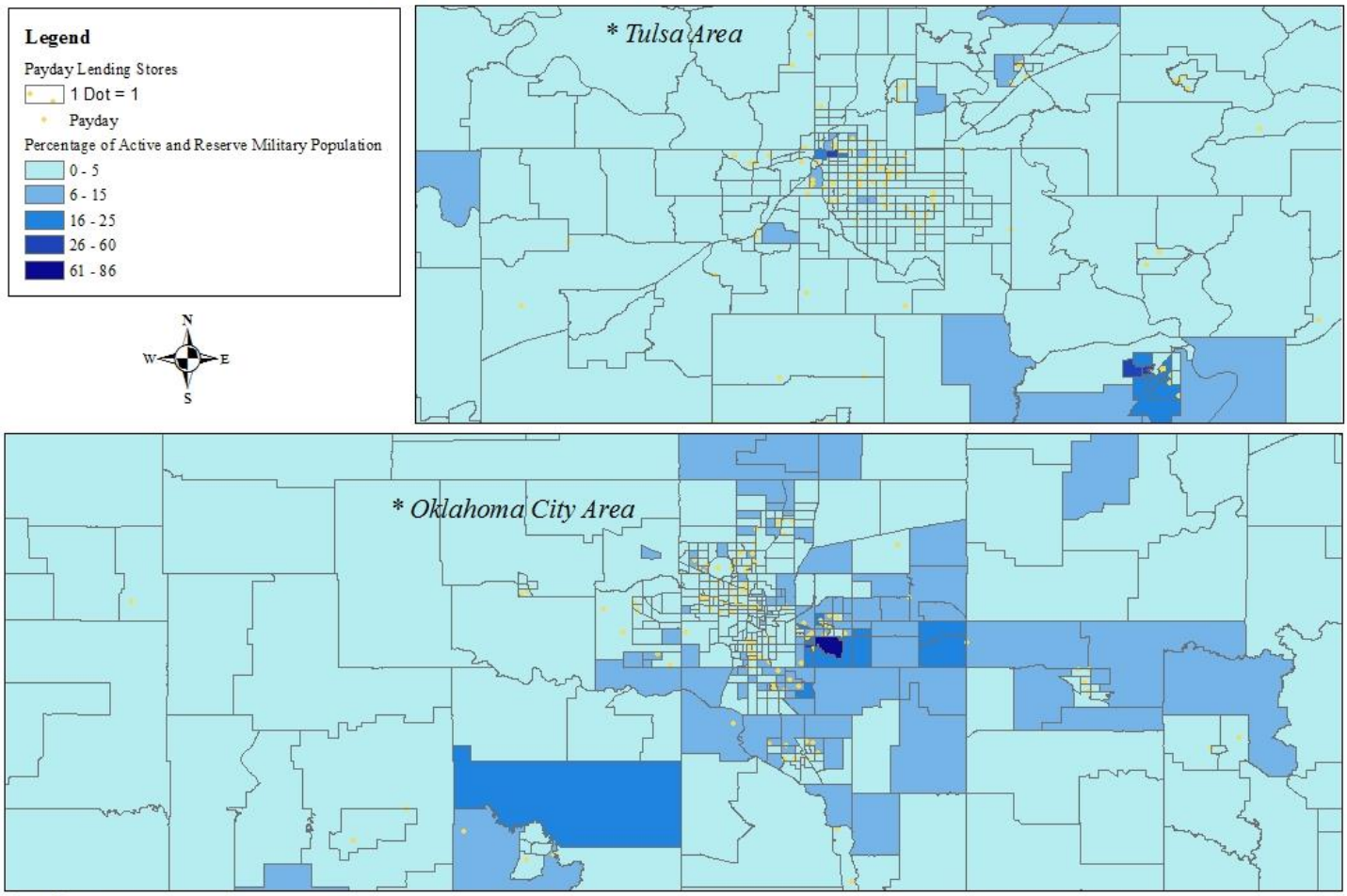
Data Sources
Female Headed Households 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 15: Dispersion of Payday Lending Stores by Military Population (Active and Reserved) Share and Census Tract



Data Sources
Tricare/Military Coverage by Sex and Age (Population of Active and Reserved Military) 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

Figure 16: Dispersion of Payday Lending Stores by Military Population (Active and Reserved) Share and Census Tract



Data Sources
Tricare/Military Coverage by Sex and Age (Population of Active and Reserved Military) 5-year estimates 2012: US Census Bureau
Payday Lenders/Deferred Deposit Lenders 2013: Oklahoma Department of Consumer Credit

5. SUMMARY AND CONCLUSION

Because of its higher APR and other abusive practices payday lending has been characterized as a form of predatory lending (Graves and Peterson, 2005). As documented by the literature, payday lenders mostly target younger, lower income, and immigrant/minority populations (Gallmeyer and Roberts, 2009; Melzer, 2011; and Prager, 2009). The industry has also found a profitable customer base among military personnel (Graves and Peterson, 2005).

By using spatial research tools such as ArcGIS we are able to demonstrate that most of the payday lenders (199 out of 324) in Oklahoma are located within 10-mile radius of military installations and bases. We were able to determine the level of concentration of payday lenders around military installations by spatially joining the national military installations and bases shape file and the census tract shape file of the state of Oklahoma. We then employed the means test and logistic regression methods to identify the demographic and economic factors that attract payday lenders to a neighborhood. Our results are summarized and presented by Tables 1-4 and Figures 1-16. Tables 1-4 show that payday lenders target economically distressed communities in Oklahoma. The census tracts with a higher concentration of economically vulnerable populations (elderly, young adults, immigrants and lower income) are more likely to be targeted by payday lending stores. Figures 1-16 show that payday lenders are more clustered around Oklahoma City and Tulsa. Table 4 further provides evidence that payday lenders more intensively target the neighborhoods with a higher percentage of economically vulnerable populations. The means test, t-test and F-test employed in Tables 2 and 4 confirm that payday lenders target economically vulnerable communities in Oklahoma and the intensity of market penetration is even stronger in the census tracts around military installations and bases. In a way, the statistical tests employed in Tables 2-4 provide statistical evidence for the visual patterns in Figures 1-16. These maps show that payday lenders are clustered in the census tracts populated mostly by economically vulnerable populations.

To improve our results we need to find a better measure of the share active military personnel at the census tract level. Our current proxy variable, obtained from the American Community Survey, measures the share of active, reserve and retired population that receives TRICARE and health benefits. As documented by the literature, the payday lenders do not target active, reserve and retired military personnel with equal intensity.

6. REFERENCES

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