Geographical Locations of News Deserts and Factors that Influence Exit of Local Newspapers

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Introduction

The problem of "news deserts" -- places where there is no traditional news outlet like a newspaper or local radio or TV -- is a challenge in the current media environment. The project at the examines geographically where the local news outlets exited and factors that could potentially influence the exits of news outlets from local areas. The resource of data includes Genealogy Bank, Burrelle 2000, U.S. Census Bureau, and ACS(2017) from Social Explorer. From these datasets, we obtained information about local news papers (exit status, geographical identifier etc.), counties' demographics, and counties' coordination.

Data Managing

- Usage of Data from Genealogy Bank
- Years of ACS selection
- Selection on matchit function in Stata
- Matched dataset & Matched and Exited Dataset
- Left Join Counties Information to Matched Dataset
- Left Join Matched and Exited Dataset to the New Dataset

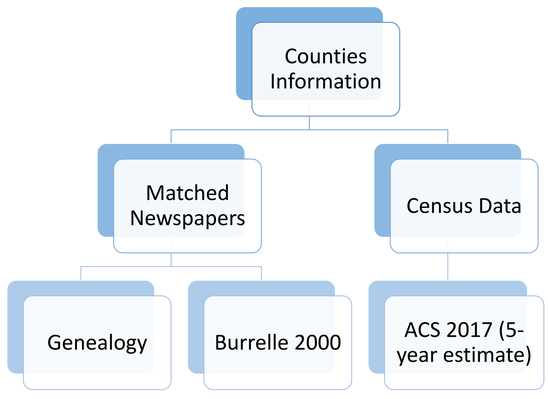

Figure 1. Data Managing Process
The Genealogy data was first matched to Burrelle 2000 by the matched function in Stata. Demographic variables in ACS 2017 was converted to rate. Then the census data was left joined to the matched Newspapers dataset to get the final counties information to proceed analysis.

Visualization

Figures 2. shows a series of boxplot comparisons. The Anova Test was implemented to different county' characteristics to test if the difference of mean is significant between Exit and Non-Exit county groups. The factors tested include counties' total population, population density, median income, unemployment rate, education level, rate of population over 65, and rate of race. All the results exhibited significant difference for means between the two groups, except race and unemployment rate exhibited

Figure 3. exhibits where news outlets has exited in U.S in the past twenty years. Each red dots represent a county with news exits. With the local news exit status, counties name, and counties' geographic coordination (longitude and latitude), the map was generated showing 240 counties with local news exited.

Figure 4.1 is the linear model results for Exit and counties' characteristics. In the data set, we use 0 for counties without news exit and 1 for counties with local news exited. After eliminating the effects of correlations, the factors that have significant relationship with whether the county has news exited are total population, population density, median income, and unemployment rate.

```
Coefficients:
                              Estimate Std. Error t value Pr(>|t|)
(Intercept)                 -1.982e-01  1.491e-01  -1.330  0.18381
total_population             1.693e-07  2.398e-08   7.061 2.63e-12 ***
population_density           1.710e-05  9.085e-06   1.882  0.06004 .
population_density_square   -1.790e-10  1.522e-10  -1.176  0.23988
median_income                4.259e-06  1.060e-06   4.017 6.22e-05 ***
unemployment_rate            1.383e+00  5.197e-01   2.661  0.00787 **
pop_rate_over65              1.210e-01  2.746e-01   0.441  0.65938
educ_rate_lesshigh          -2.659e-01  3.115e-01  -0.854  0.39352
educ_rate_abovecollege       5.534e-02  1.713e-01   0.323  0.74674
black_rate                   7.291e-02  8.064e-02   0.904  0.36609
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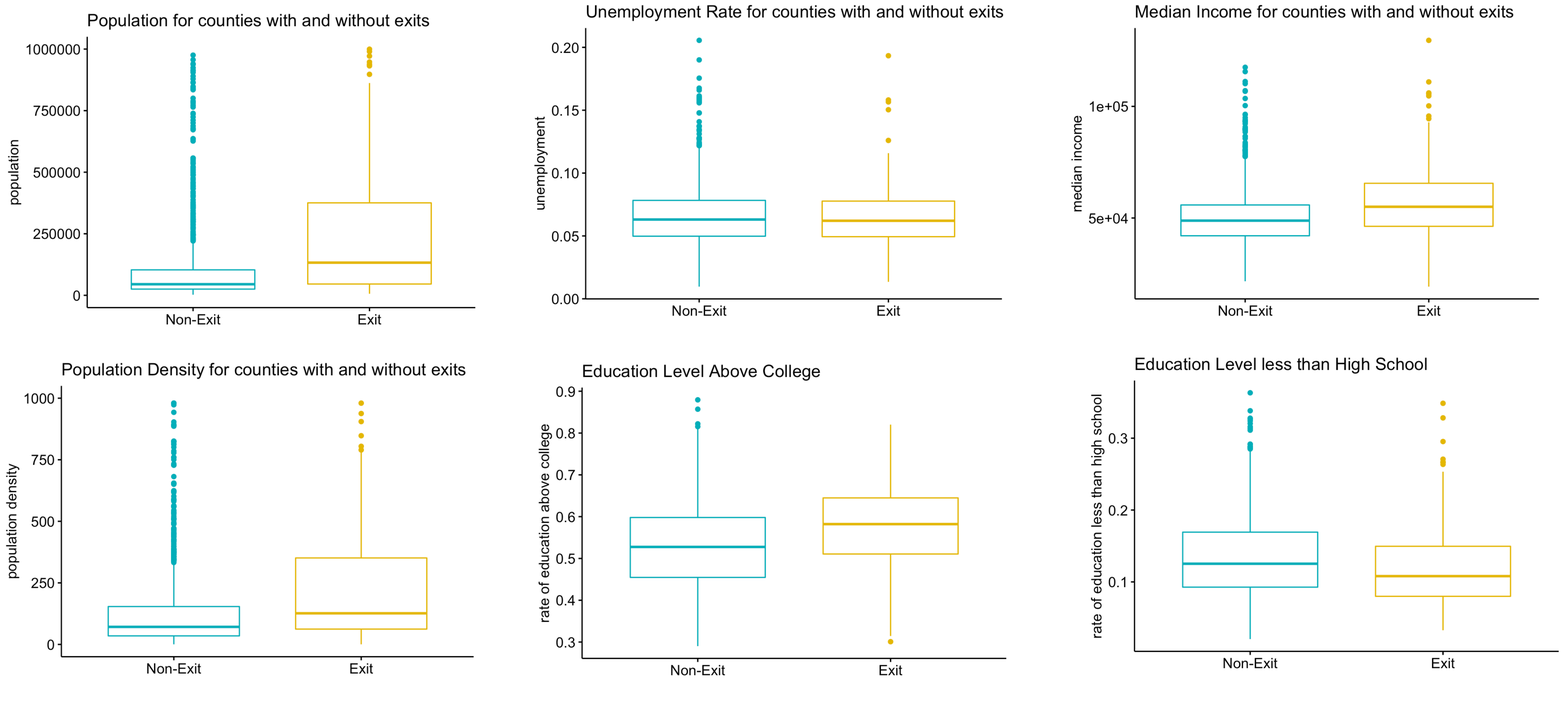
Figure 4.1 Regression Linear Model 1
This model shows the regression results between whether the county has news exits and county characteristics.



Figures 2. Boxplots Comparisons.
These boxplots compares different factors of counties by two groups—whether local news outlets exited in the county. The factors include county Population, Population Density, Median income, Unemployment rate for labor force over 16, Rate of population over 25 with Education Level less than high school, Rate of population over 25 with education level above college.

US Local News Outlets Exited

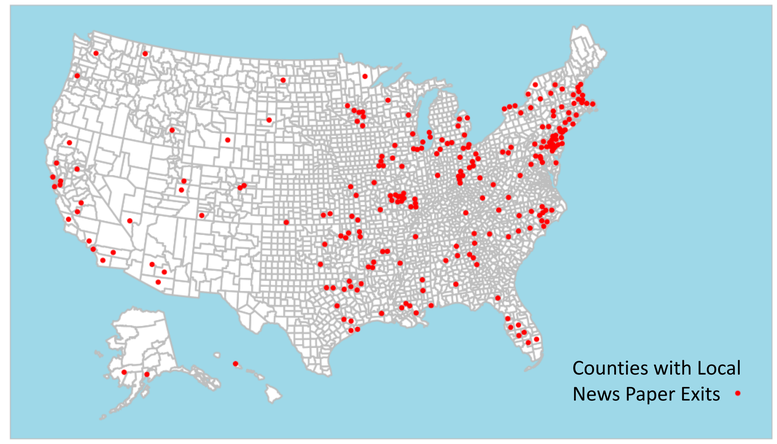


Figure 3. Local news Exit Map
Showing 240 red dots representing counties with news exited

Discussion

Based on the map Figure 3., we can conclude that majority of counties with news exited concentrates on counties that consist bigger cities (New England area, California etc.). These locations have denser and higher population, and both median income and unemployment rate are relatively high (Figure 4.1). Other factors like education level, age, and race do not have significant relationship with whether the county has local newspaper exits.

From Figure 4.2, we can tell that counties with denser population (most likely urban areas) tended to have high number of local newspapers. This leads to another possible factor that may cause the local news outlets to exit in counties—the original number of newspapers in the county.

```
Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)      1.8861292  0.0846791  22.274   <2e-16 ***
population_density 0.0002594  0.0000308   8.424   <2e-16 ***
```

Figure 4.2 Regression Linear Model 2
This model shows the regression results between the number of local newspapers in the county and the population density

Figure 5. and Figure 4,3 shows that there is a positive relationship between the number of local newspaper in the county and whether the county has news exits. Urban areas, which have more local newspapers, denser population, higher median income and unemployment rate, are more likely to have local news exits.

Number of newspapers	1	2	3	4	5-9	10-19	24-29	39	63
Non-Exit	849	176	53	28	20	4	0	0	0
Exit	65	49	35	25	42	17	5	1	1

Figure 5. Table
Grouped by number of local newspapers in counties, the table displays the number of counties with and without news outlets exits.

```
Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.081518   0.011236   7.255  6.7e-13 ***
numpapers   0.046527   0.002998  15.518  < 2e-16 ***
```

Figure 4.3 Regression Linear Model 3
This model shows the regression results between whether the county has news exits and the number of newspapers in the county

Data Source

1. ACS 2017 (5-Year Estimates)(SE), ACS 2017 (5-Year Estimates), Social Explorer; U.S. Census Bureau
2. Genealogy Bank
3. National Counties Gazetteer (2019), Gazetteer Files, U.S. Census Bureau
4. Burrelle Media Directory 2000