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Examining Migration Flows Across Kentucky's Counties

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Examining Migration Flows Across Kentucky's Counties

James Brady Stein

3/8/2023

Abstract

The state of Kentucky is home to many rural counties which experience high levels of outward migration due to their relatively unfavorable economic conditions. While migration trends nationally have begun to plateau, migration flows from county to county show a much more volatile story. This study will examine the relationship between economic opportunity and migration flow estimates in Kentucky's counties through a multiple regression approach with the response variable being annual migration flow estimates, with multiple predictor variables showing the economic composition of the county. Variables used in this regression include annual unemployment rates, educational attainment levels, county poverty rates, and the percentage of a county's population that is of the prime working age, 25-54. Based on the results of this regression, it was determined that there are a few counties in Kentucky that despite relatively unfavorable economic conditions, have been able to stem the flow of outward migration and either maintain their existing working population, or attract new citizens to their county. At the heart of this research is the question of why some of these counties have been more successful than others in retaining their young people despite these existing economic hardships. Due to this finding, interviews with public officials, organizations, and agencies associated with these "bright spot" counties were conducted and the results of these interviews were used to highlight the strategies used by these counties to stem the flow of outward migration, while also providing other county, state, and national leaders with recommendations based on the success stories of these few Kentucky counties.

Introduction

Although the state of Kentucky, as a whole, has witnessed a steady growth in overall population since its inception as a state in 1792, these trends are much more volatile within the state, especially from county to county. While exploring the migration flows and population trends at the county level can be difficult, it better tells the story of what migration has looked like in the state of Kentucky. Because of this, I want to provide a comprehensive research analysis to county officials across the state of Kentucky in hopes of examining the relationship between economic opportunity and migration flows in Kentucky's counties and determining why some counties are more successful than others in keeping out-migration to a minimum despite less than favorable economic conditions.

While the Commonwealth of Kentucky is home to some of the most economically disadvantaged counties across the entire United States, the bulk of these counties exist in the Eastern Kentucky Appalachian region. Many of these counties are burdened with relatively high unemployment rates, providing much of the eligible workforce with little to no opportunities. Due to this inclination, many residents of these disadvantaged counties migrate away from their homes to seek better opportunities in other counties or possibly even other states. As a result, these counties face high rates of outward migration, causing a vicious downward economic cycle. Previous literature supports these claims, as they have displayed Eastern Kentucky as a complex place marked by high levels of outmigration following the nationwide trend of urbanization. Despite this trend remaining fairly true across the rural counties of Kentucky, the literature also recognizes that there are some counties, primarily in Inner Appalachia, that have successfully stemmed this flow of outward migration and have even found ways to remain attractive to citizens, despite the poor economic conditions.

These migration patterns have evolved away from the more permanent residential moves to a model of more temporary migration, where young and elderly people alike, are beginning to return to their home county to live. While much of the existing literature available focuses on Eastern Kentucky's Appalachian region, the hope is that this research will provide a lens into the trends across the entire state. In addition, previous studies have focused on the individual motivations to migrate away or stay put, and while those motivations are important for this research as well, the focus will instead be on the county-level perspective. That is to say, the hope is to bridge the gap between individual motivations discussed in the existing literature and the programs, initiatives, or developments implemented at the county government level that will hopefully be explored through this study

For this analysis, data from the American Community Survey's 5-year estimate data set at the county level as well as unemployment data from the Kentucky Center for Statistics are used to employ a regression model. This regression will produce results exploring the relationship between annual net migration flow estimates and annual unemployment rates for Kentucky's counties, controlling for educational attainment, poverty rates, age distribution primarily of the prime working age population, being in a metropolitan area, and the economic makeup of a county. Results of this study are forthcoming. The hope of this study is to fill a gap that the existing literature does not focus on, trends in the state of Kentucky as a whole and a fresh perspective of the motivations surrounding migration decisions from the county government level.

Literature Review

While it is important to understand the history of Kentucky's migration from across the entire state, much of the relevant literature focuses on one region in particular, the Eastern Kentucky Appalachian region. Although migration within the state is volatile from border to border, Eastern

Kentucky serves as an important case highlighted by a once booming population and strong infrastructure. Because of this, it is important to synthesize the existing literature by first discussing these migration trends over time to bridge the gap of how the Appalachian region and the state of Kentucky has gotten to where it is today, describe the current environment, and then end with what my research will contribute to this topic.

“The history of Appalachia is complex, marked by both catastrophe and rebirth,” (Williams, 2002; Sears, 2022). Prior to 1950, the Eastern Kentucky Appalachian region witnessed a combination of rising in-migration and a booming economy thanks to a rise in the demand for coal. While the coal industry remained strong for the decades following, the people in these counties were seeing a completely different trend backed by the “mechanization of mining activities forcing the continued displacement of mine workers,” sparking a massive uptick in outmigration from this region of the state (Eller, 2008; Sears, 2022). On a larger scale and not just specific to Kentucky, rural populations began to decline as urbanization swept across the nation, as a greater number of people began to move from their rural homes, into more urbanized cities in search of better opportunities for education and employment. This trend created an “economic gap between these rural Appalachian areas and the rest of the nation,” backed by above average poverty rates and poor economic standards (Eller, 2004). In fact, “between 2012 and 2016, all but one of Kentucky’s 54 Appalachian counties had poverty rates above the U.S. national average, and 37 ranked in the bottom 10 percent of counties nationally based on economic standards,” (Appalachian Regional Commission, 2018). Not to mention the environmental, social, and public health issues that these counties have faced due to the coal industry and its ensuing collapse. The Eastern Kentucky Appalachian region is one that continues to lag behind the rest of the country economically, socially, and politically, forcing its residents to simply move away to find better opportunities.

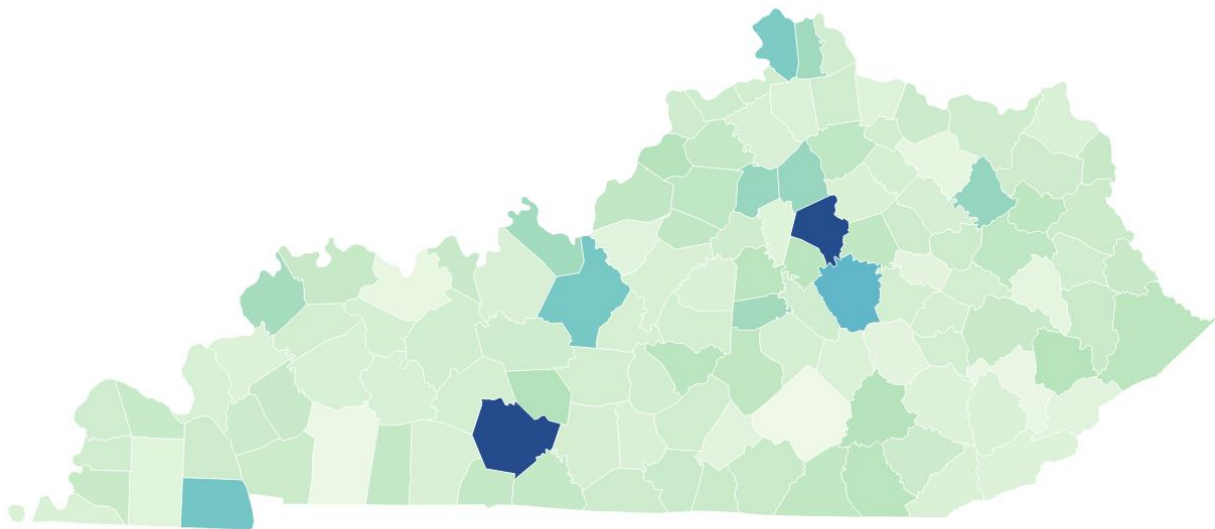
Now that these historical motivations for migrating away from this region have been discussed, it is important to note where these Kentuckians are moving to. Many of these rural Kentuckians did not migrate too far, electing to move to places like Lexington, Louisville, and the Northern Kentucky suburbs of Cincinnati. This influx of in-migration has created significant population and economic booms for these areas and their surrounding counties. "From 2010-2017, Jefferson County added the largest number of total residents, followed by Fayette County," while counties like Boone in Northern Kentucky saw double digit growth rates (Burnett, 2017). While these more metropolitan counties were growing, many of Eastern Kentucky's Appalachian counties such as Pike, Floyd, and Martin County "lost the largest number of residents from 2010-2017," and an additional sixteen counties lost "at least 5 percent of their population," (Burnett, 2017). Others have elected to move out of state, including to Kentucky's southern border state, Tennessee. While the focus of this research will remain on the in-state, county-to-county migration flows, it is important to point out that Kentucky's southern border counties are losing hundreds of millions dollars in annual wealth as a result of these migration trends. In fact, according to IRS and Census data, "Tennessee counties along the Kentucky border gained nearly \$2 billion in annual wealth between 1992 and 2015, while the Kentucky counties lost nearly \$500 million in annual adjusted growth income," simply as a result of these migration trends (Harris, 2017).

Interestingly enough, more recent trends and studies have shown that migration flows have shifted back in favor of the Eastern Kentucky Appalachian counties. While these more urbanized areas situated in Fayette and Jefferson County still are experiencing high influxes of people migrating into their communities, the counties of Inner Appalachia are also showing net migration flows that are trending in the positive direction, or at the minimum, are breaking even and not losing residents of their county, despite less than ideal economic conditions. Many of these counties are situated in the rolling hills and mountain terrains of Eastern Kentucky and are

unable to provide the same employment or educational opportunities available in other counties across the state, however, apparently, these counties remain attractive places for their citizens to live. The map shown below depicts the total net migration flows from the years 2009 to 2019 for each county in Kentucky.

Figure 1: Map of Total Net Migration Flows

Total Net Migration Flows, 2009-2019



Created with Datawrapper

The existing literature regarding migration in Kentucky looks at this phenomenon from a few different lenses, debating the role of the younger generation and the elderly populations of Eastern Kentucky and showing how they have and can contribute to these positive trends in migration flows. Keeping with the historical flow of this section, the elderly population will be discussed first, as these are the people who contributed to the major labor migrations witnessed in earlier decades. As mentioned previously, Kentucky has a long history of relatively modest out-migration caused by a “low rank on measures of attraction and demographic impact,” (Flynn

et al., 1985). Backed by the booming coal industry of the mid-1900's, Kentucky's elderly population was relatively high at one point as those who migrated in for employment tended to stay put. That was until the coal industry crashed, bringing down the communities within them as well. Kentuckians, both young and old, were forced to migrate due to a changing economic landscape coupled with rising unemployment rates. Consistent with the volatility of the coal industry, Kentucky's migration flows continued to change from decade to decade. Following this era, development in the infrastructure of Eastern Kentucky provided a more attractive destination for the elderly and young alike.

Further research has shown that many of these positive trends in migration have been attributed to the return of Eastern Kentuckians to their home counties. Out-migration flows observed historically have shifted from much longer and more permanent moves to more temporary moves for educational or employment purposes. Once these motivations are fulfilled, migrants typically will return to their home counties, significantly impacting the demographic structure of Eastern Kentucky, or whichever county they return to. While some research shows, at the national level, "25 percent of all moves appear to be return migration," other research specific to Eastern Kentucky suggests that "72 percent of in-migrants are returnees," (DaVanzo and Morrison, 1981; White 1987). Consistent to what has been mentioned previously, many of these returning migrants are settling in the Inner Appalachian counties of Eastern Kentucky, defying a consistent economic rationale for this migration as many of these counties have limited infrastructure and opportunities available. Because of this fact, it becomes difficult to build a model based on, "the traditional income, unemployment, and labor force indicators," that typically define these patterns of economic change (White, 1987). Without much change in the economic landscape of these communities, the question now becomes: what are the motivations involved with this return migration?

Two studies conducted by Barcus and Brunn introduce the concept of place attachment, providing evidence towards an answer to this question. Termed through their research as place elasticity, they focused on those populations that may be defined as immobile. Based on case studies of rural Eastern Kentucky residents, Barcus and Brunn were able to conclude that Eastern Kentucky is a place “defined by strong place attachments” and a commonality between individuals regarding “a connection back to the home county,” (Barcus and Brunn, 2010). While their specific research design makes it difficult to link place attachment beyond the breadth of Eastern Kentucky, the foundational results are important. The findings of their studies show that this place attachment concept does not necessarily constitute permanent residency in one of these counties, but instead maintaining a connection to the area contributes to the prospect of future return migration to the home county. As pointed out in their literature, “the concept of place attachment is often overlooked in terms of migration,” but is equally important when determining the motivations for migrating or staying put (Barcus and Brunn, 2009). While these results are important, they must be examined with caution. Barcus and Brunn implemented a research design where they surveyed Eastern Kentucky residents at a family reunion setting, creating a small sample size coupled with similar characteristics, that do not provide a rich data set enough to make assumptions regarding the rest of the state. As noted previously, much of the existing literature focuses on the Eastern Kentucky Appalachian region, creating a major limitation when examining trends within the state, as a whole.

Finally, it is important to mention the current, working literature that has defined the role of the younger generation in the migration of Kentucky. Recent estimates examined from the American Community Survey data indicate that “the percentage of young adults between the ages of 18 and 24 is well below the national average in nearly all of Kentucky’s Appalachian counties,” (Pollard and Jacobsen, 2018). However, these younger adults have had a significant role in the transformation of these counties due to their “commitment to staying and working to

improve the economic, social, and environmental challenges,” observed in Eastern Kentucky (Sears, 2022). Younger adults have led the effort in supporting development, entrepreneurship, and other rewarding initiatives that have aided in renewing the economies and sociocultural aspects of these Appalachian counties. With projections showing that by 2050, “90 percent of the U.S. population would live in cities,” that have become urbanized, Sears’ study is important to this research as it provides data on the decision making of young adults that are at the prime stage in their lives to migrate away and follow suit with urbanization or choose to remain in their home county (United Nations, 2014; Sears 2022). The hope of this research is to build upon the existing literature, but also contribute fresh ideas to the topic of migration in Kentucky. While most of the data available and studies completed are outdated, this research will analyze more current migration and population estimates, while looking at the motivations for migration from the county-level perspective, instead of the individual themselves.

While It will be explored further in the results section about these counties, many of which are in Eastern Kentucky, that have been successful in stemming the flow of outward migration, existing literature has shown, generally, what works for remaining attractive to, or providing social and economic opportunities, for all. In general, counties that can be considered economically healthy provide a quality education, sustainable jobs that generate a fair income, and plenty of family and social support within the community. While there is no single strategy or attribute that can ensure the health of a county, these factors, among many others, influence the overall health of the community and its people. As it will be shown later, not every community has the means and available opportunities to be healthy, as will be evident by the Kentucky counties with high levels of outward migration coupled with unfavorable economic conditions. Many of the counties that will be explored as “bright spots” in the results section of this paper are counties that already do have higher observed rates of unemployment which can limit the ability for these individuals within these counties to thrive. However, providing the individuals in

a community with more quality educational opportunities, not just in the classroom, but beyond, will allow these individuals to live longer, healthier lives than those that may be less educated. In a region, and state, dominated by manufacturing and other trade type industries, many of these counties can build upon opportunities such as a technical school or trade school that will allow an individual to receive this education in a field where jobs are available in their own community. In this scenario, the individual is able to remain in their home county and receive similar opportunities without having to migrate away. This cycle creates a stronger community where greater social support and less isolation leads to greater access to support and resources allowing those people to continue a healthy life in their home communities, as has been mentioned previously when the idea of place attachment in Eastern Kentucky was explored above.

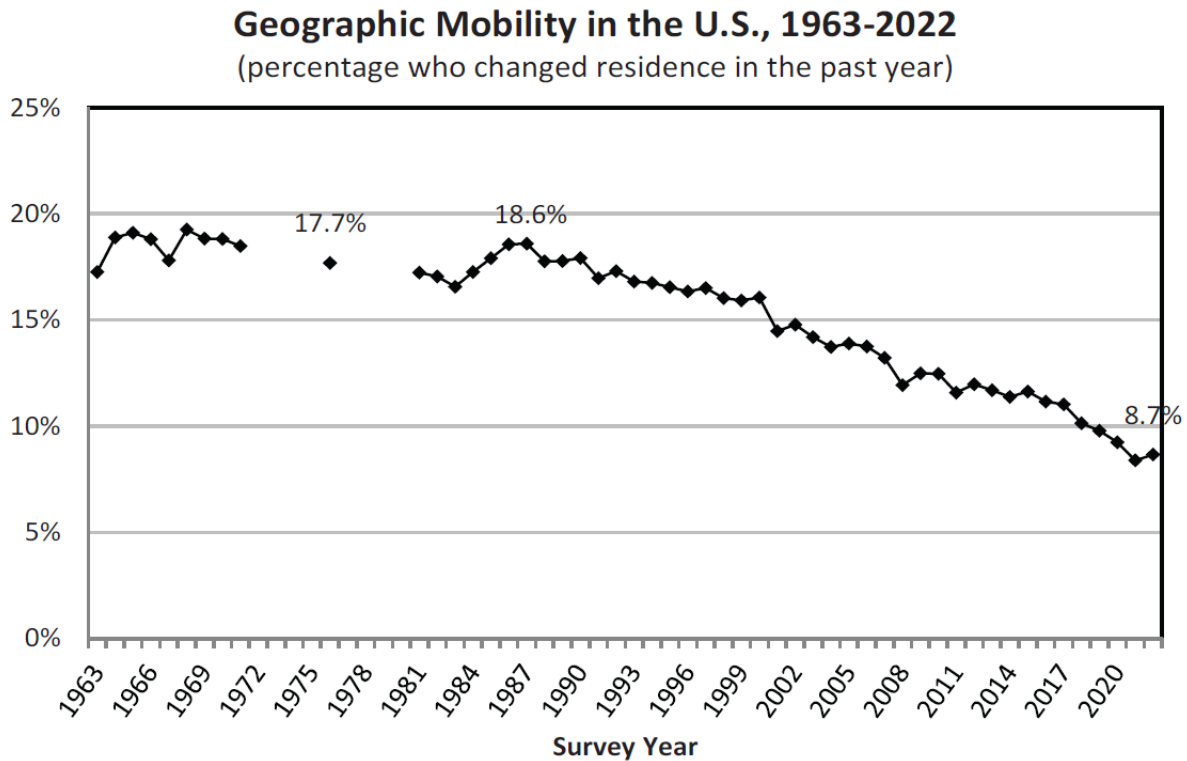
Background

From a policy perspective, outward migration can be dealt with through sound development policy. In pursuit of alleviating economic distress in those regions that may lag behind others economically, the federal government has provided aid to local public sector activities, creating such programs as the Appalachian Regional Commission (ARC). Among other programs, the ARC was set up to “invest in the region’s infrastructure in order to aid the people,” (Hansen and Fowler, 1974). These regional development policies have invested in both the economic infrastructure of the counties within this region, but have also provided opportunities for human development and have created “growth centers” to assist in diverting migration from these larger, metropolitan areas to more “intermediate-size areas” directly outside of these impoverished counties (Hansen and Fowler, 1974). Many of the relevant policy initiatives regarding migration have focused on further developing these “lagging regions,” instead of pumping resources into these larger, metropolitan areas that have become congested with in-migration. Policy researchers, such as Niles Hansen, assume that “migration contributes

significantly to poverty, public welfare, and social disorganization,” often leaving those who migrate in with the same, or even worse, conditions as what they left in their home county (1974). The assumption here is that neither the migrants nor the metropolitan areas benefit from policies that encourage only urban growth and do not focus on the economic development or industrialization of these rural areas. While these policies are specific to the entire Appalachian region, and not just Kentucky, the ARC has provided funding for multiple projects investing in growing these rural areas and developing the labor force to allow new industries and the economy to thrive.

On a national scale, migration trends in the United States have consistently decreased over time. At one point, around the 1940s, “nearly one-fifth of Americans changed their residence each year,” (Gatton College of Business & Economics, 2023). This number has since crept below 10 percent thanks in part to recent phenomena with the Internet that has made remote work extremely popular. Workers have realized that they are able to have the same economic opportunities no matter where they live, so the pull for urbanization has decreased. This trend is evident in the Eastern Kentucky Appalachian region, mentioned throughout this paper, and has allowed for the migration flows in some counties to turn course and head towards a more favorable outcome. The graph below shows these trends in mobility nationwide. Data from the years 1972-1977 and from 1977-1981 were missing from the sample used by Flood et al., and thus provide a gap in the data that can be observed in the graph.

Figure 2: Geographic Mobility Graph



Source: Author's calculations based on data from Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren and Michael Westberry. Integrated Public Use Microdata Series, Current Population Survey: Version 10.0 [ASEC, 1963 to 2022]. Minneapolis, MN: IPUMS, 2022. <https://doi.org/10.18128/D030.V10.0>

Specific to Kentucky, the state has enacted policies aimed at developing the younger generations which call the Kentucky Appalachian counties home. Initiatives such as the Shaping our Appalachian Region (SOAR) have been created to allow young adults the chance to develop themselves and their home county, in hopes that they would not migrate away to other areas in search of a better opportunity. SOAR has a hope of adding nearly “30,000 jobs to Appalachian Kentucky through projects related to broadband access, local food systems, tourism, healthcare, small business, and workforce training,” (SOAR, 2016). Other organizations, such as the Kentuckians For the Commonwealth and the Kentucky Student

Environmental Foundation have been developed through these policies in an effort to encourage the younger generation to become more involved and have a hand in attending to the economic concerns of their communities.

Data & Research Design

Data Plan

For this analysis, two primary data sources consisting of administrative or secondary survey data were used. First, data from the U.S. Census Bureau's 5-year estimate dataset compiled from the American Community Survey (ACS) were used. To keep this analysis focused on the years following the 2008 recession and preceding the 2020 pandemic, only the data available from the years 2009-2019 were used. The focus within this dataset was on their county-to-county migration flow data. Specifically, one of the questions included in the ACS dataset asked respondents if they lived in the same residence a year ago, and if not, collected their residential county from the previous year. These data are measured as annual estimates, calculated by the number of people. To compare urban and rural counties, and to be consistent with the unemployment rate data, this migration data was analyzed in terms of the percentage of population. These annual population estimates are also included in the ACS data set. In addition, a few other variables from the same ACS 5-year estimate dataset were used as control variables, including, educational attainment, poverty rates, age distribution (primarily focusing on the prime working age population), and whether the county resides in a federally designated metropolitan area. In addition, a series of dummy variables are incorporated to indicate the economic composition of the county's economy. These variables show the employment levels by major industry sector and whether that county is above the mean for the major industries included.

Data from the Kentucky Center for Statistics, specifically their Local Area Unemployment Statistics Report, were also used as a part of this analysis. This report shows data on the annual unemployment rates for all 120 Kentucky counties from the same period, 2009-2019. Citations for both data sources are included in the references section.

These data sources provide the background information that will be used to build a regression model exploring the relationship between annual unemployment rates and annual net migration flows for Kentucky counties. Because of the possibility that these two variables could mutually affect one another, the focus will be on exploring the relationship between the two variables, rather than if one variable has a definitive causal effect on the other. Specific to this research question, people may migrate away from a county because the unemployment rate is so high, but on the other hand, the unemployment rate could be high because of the effects of out-migration.

Data from both the ACS 5-year Estimates data set, as well as unemployment data from the Kentucky Center for Statistics' Local Area Unemployment Statistics Report were merged together for this analysis. These data include county level data for the years 2009-2019 and provide usable variables for my regression analysis. It is important however that to make sure that these data sets are consistent with each other to develop significant results. For example, it was mentioned above about how it is important for this analysis to present the annual migration flows as a percentage of the county's population estimate, to accurately compare urban and rural counties that may have very different populations.

This quantitative analysis is further supplemented by a small amount of qualitative data. After analyzing the administrative data mentioned above through a regression model, the predicted values and residuals were obtained to identify any counties that may be considered as outliers in this dataset. Specifically, these outliers would be on any counties that may have performed

better than expected in terms of their estimated migration flows based on the model. This would suggest that there are some counties with poor economic conditions that have been able to retain their population at a rate that is better than expected, or have seen more people migrating to their county, resulting in a net positive migration flow. The qualitative data dives deeper to explore why these counties have these better than expected results.

Research Design

The method used to analyze these data is a regression analysis. Specifically, the analysis focuses on the relationship between the annual unemployment rates and annual net migration flow estimates for all 120 of Kentucky's counties, holding all other variables constant. The logic behind using a regression method is to bring together multiple county level variables to explore this relationship, shedding light on the issue of outward migration that many Kentucky counties have faced over the years. Exploring these variables in a regression model allows for the development of a rational explanation, based on the data, to the relationship between annual unemployment rates and annual net migration flows, holding all other variables constant. Specifically, my regression model incorporates the annual unemployment rates as a percent, the annual net migration flows as a percentage of the county's annual population estimates, and a variety of control variables such as educational attainment, poverty rates, prime working age, and whether the county resides in a federally designated metropolitan area. Additionally, a series of dummy variables are incorporated indicating the economic composition of the local economy. These variables explore the employment of each county broken down by the major industry sectors. Below is the regression equation:

NetMigrationPopulation

$$\begin{aligned} &= \alpha + \beta_1 \text{UnemploymentRate} + \beta_2 \text{HighSchoolGraduateorHigher} \\ &+ \beta_3 \text{AssociatesDegreeorHigher} + \beta_4 \text{BachelorsDegreeorHigher} \\ &+ \beta_5 \text{PovertyRate} + \beta_6 \text{PrimeWorkingAgePopulation} + \beta_7 \text{MetroArea} \\ &+ \beta_8 \text{AccomodationFoodServices} + \beta_9 \text{Construction} + \beta_{10} \text{FinanceInsurance} \\ &+ \beta_{11} \text{HealthCareSocialAssistance} + \beta_{12} \text{Manufacturing} + \beta_{13} \text{OtherServices} \\ &+ \beta_{14} \text{ProfessionalServicesTechinca} + \beta_{15} \text{RetailTrade} + \beta_{16} \text{WholesaleTrade} \end{aligned}$$

Based on the results from this regression analysis, the predicted and residual values were obtained to determine if there are counties that fit this outlier criteria and have results that are better than expected. From there, any counties that showed a residual value greater than 0.5 were determined to fit this criteria and were seen as a “bright spot” of the analysis. After determining these “bright spots” in the analysis, qualitative data was collected through short interviews with county officials and other public organizations and agencies in these counties. The main point in conducting this qualitative analysis is to figure out what it is about these counties that have allowed them to be successful in growing or maintaining their population despite poor economic conditions. This includes determining if there are any specific strategies, programs, or initiatives that these counties may have implemented to stem the flow of outward migration. Namely, the basis behind these interviews is to find out why are some counties more successful than others in retaining their young people despite existing economic hardships. The questions that asked during these interviews are as follow:

- What factors do you believe have contributed to your county’s current economic conditions, specifically a high rate of unemployment?

- What factors do you believe have allowed your county to maintain or grow in population despite these poor economic conditions?

- Are there any specific strategies, programs, or initiatives that your county has implemented that would have helped to stem the flow of outward migration?

- What recommendations may you have to other county officials across the state that may be struggling with outward migration due to their poor economic conditions?
- Is there anyone else that you recommend that I talk to in your county that could provide insight on your county's situation?

The results of these interviews were compiled to provide a discussion in efforts to give an explanation for why these counties have found success in stemming the flow of outward migration at a rate that is better than expected. The focus centered around the solutions that these counties have identified that have helped them to stem the problem of increasing outward migration across the state, especially for those counties with poor economic conditions. Initially, I had planned to conduct these interviews directly with the elected officials of these "bright spot" counties, however due to a lack of response, I was forced to switch the focus elsewhere. Instead, I was able to conduct these interviews with organizations such as Shaping Our Appalachian Region (SOAR), the Kentucky Association of Counties, and the Kentucky County Judges and Magistrates Association. These organizations share a mission to advocate for and support the advancement of Kentucky, its counties, and county officials, providing a breadth of knowledge regarding the economic composition and potential migration trends observed in these counties. The staff at these organizations work hand-in-hand with county officials daily, possessing much of the knowledge I sought after to begin with. This allows the staff at these organizations to provide particularly good insights into the explanations of the performance of these counties in terms of migration. While the lack of response from my initial participant pool provides a limitation to my analysis, the information obtained from the interviews conducted helped to fill this gap.

These methods help to address the research question by providing an analysis that can be used as evidence showing an observed relationship between annual unemployment rates and annual

net migration flows, controlling for education, poverty, age, and metropolitan area. The administrative data is used to develop these variables used in the regression model to help test the hypothesis of whether there is a correlational relationship between the annual unemployment rates and the annual net migration flows of Kentucky counties.

This research and analysis do have its limitations, however. Since the administrative data primarily used are pulled from the American Community Survey and are strictly estimates, the results may not represent what is really occurring in these counties regarding their migration flows. While conclusions are still made, the analysis may not be completely applicable to the real observed effects and thus may be inconclusive. In addition, merging the two data sets together also provides a limitation to the study. For county level estimates in Kentucky, the only data sets that can be used are the 5-year ACS estimates. These are the only estimates available for all 120 counties. Since annual unemployment estimates from a single year are merged with the 5-year ACS estimates for this analysis, it provides a limitation for the study. Since the ACS data represents pooled values over a five-year period, it is difficult to precisely measure differences from one year to the next. While this is not ideal, the analysis can still work.

Results

The table included below shows descriptive statistics regarding the results obtained from the sample used in this analysis. These values are expressed in terms of percentages. Further analysis regarding the content of this table is included below.

Figure 3: Table of Summary Statistics

Means and Standard Deviations of Variables (in terms of Percentages)

<i>Variable</i>	<i>Mean</i>	<i>Standard deviation</i>
Net Migration by Population	-0.12	2.34
Unemployment Rate	8.08	
Educational Attainment:		
High School Graduate or Higher	78.91	
Associate degree or Higher	21.88	
Bachelor’s Degree or Higher	15.00	
Poverty Rate	21.32	
Prime Working Age Population	38.68	
Metro Area	28.30	
Employment by Major Industry:		
Accommodation and Food Services	53.03	
Construction	36.82	
Finance and Insurance	42.80	
Health Care	42.73	
Manufacturing	43.26	
Other Services	41.44	
Professional Services	38.94	
Retail Trade	50.53	
Wholesale Trade	45.00	
Observations	1,320	

Based on the above table containing descriptive statistics about the predictor, outcome, control and dummy variables, the mean net migration by population in this sample is -0.12% with a standard deviation of 2.34%. What this result shows is that, in this sample, the overall net migration flow is estimated to be near zero, on average, for the entire state. On average, this value shows that out-migration across the state is actually near zero. This supports what was discussed at the beginning of this report, where migration flows across the state are less volatile than the migration flows occurring in each county. To better understand the effect of the Net Migration Flows by Population for each county, take the following example. From 2013-2015, Anderson County experienced a total net migration loss of nearly 1,200 residents, leading to an

estimated loss of nearly 6% of their population and close to 2% of their prime working age population. In terms of the job market, this corresponds to an estimated loss of nearly 500 employees over this three-year period. Anderson County is a county with more favorable economic conditions, on average, than most counties across the state, sporting a below-average unemployment rate and an educated population, with close to 90% of their citizens included in this sample having at least graduated from high school. Nonetheless, the loss of nearly 500 prime working age employees causes a detriment to the county's economy as occupational license and real estate tax revenues are lost. On the other hand, Elliott County witnessed an estimated net migration increase of nearly 400 citizens over the same time period, an almost 5% increase in the estimated population. With annual unemployment rates well above the state's average each year, these positive net migration flows have helped bring more educated, working-age citizens to the county helping to continuously strengthen the job market and economy of Elliott County.

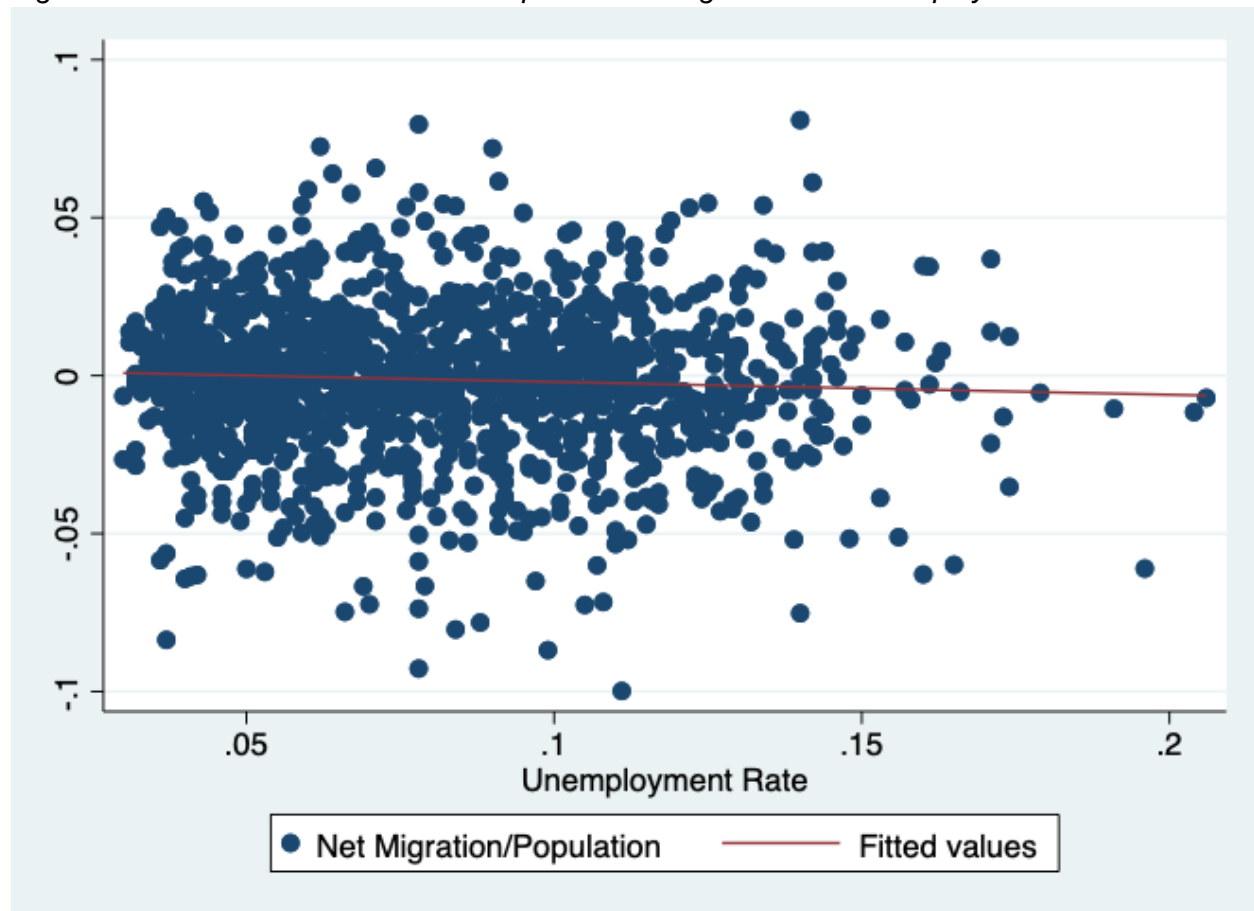
Moving forward, the mean value for the unemployment rate is 8.08%, indicating the estimated average unemployment rate for all Kentucky counties in the period of 2009 to 2019. Of the respondents used in this sample, the average number of respondents in the state of Kentucky with at least a high school diploma is 78.9%, while the average percentage of respondents with an associate's degree or higher is 21.9% and the average percent of respondents with a bachelor's degree is 15%. The mean value for the poverty rate variable is 21.3% meaning that of the county population estimates, this is the percentage of respondents that live below the poverty level, on average. The prime working age variable estimates that 38.7% of county population estimates in this sample are comprised of those in their prime working age, determined to be between the ages of 25-54, on average. In addition, the above table shows mean values for the dummy variables included in the analysis, metro area and employment by major industry sector. Counties were given a value of 1 if they were deemed to be in one of the

several metropolitan areas in Kentucky determined by the Office of Management and Budget, and a value of 0 if they were not in one of the metropolitan areas. A map showing which counties are included as Metropolitan areas has been included in the Appendix of this paper. The mean value of 28.3% shows that a greater majority of Kentucky counties are not located in metropolitan areas. For the employment by major industry sector, counties were given a value of 1 if they were above the mean for one of the major industry sectors included in this analysis, and a value of 0 if they were not above the mean. To determine if a county is above the mean or below the mean for employment in these industries, the percentage of the working population for each industry in each county for the years 2009-2019 were analyzed. If one of the major industries listed had an employment composition over 50% of the working age population in that county, a value of 1 was given to show that this county was above the mean for the specific industry. The industries included were determined by identifying the major industries that the Kentucky Department of Economic and Workforce Development report are most important for the state. The above results show that with a value above 50, the Accommodation and Food Services sector and Retail Trade sector are, on average, able to be considered major industries across the entire state of Kentucky for this sample. Not to say that the other industries included are not equally as important to the state of Kentucky, however, based on this sample, the majority of respondents across the entire state work in the Accommodation and Food Services or the Retail Trade sector.

Figure 4 shows a scatterplot that examines the relationship between annual net migration flow estimates by county population and the unemployment rates of these same counties. This scatterplot shows that much of the data is bunched up right around the mean, indicating that, in this sample, most counties in Kentucky witness relatively normal flows of migration based on counties' unemployment rates. There are a few spots to highlight that show potential outliers in the scatterplot. Those observations located below the line of best fit and broken away from the primary bunch are counties that seemingly have higher unemployment rates in relation to and

are witnessing a negative net migration flow, constituting to higher levels of outward migration. This is a normal occurrence, as it is obviously stated and agreed upon that counties with higher unemployment rates and worse economic conditions see more residents migrate away in search of better opportunities. On the other hand, the observations that are located above the line of best fit and broken away from the bunch are the more interesting observations for this analysis. These observations, located in the top right corner of the graph, represent counties that have higher unemployment rates, but despite the poor economic conditions, observe positive migration flow estimates. While this graph focuses on the bivariate relationship between unemployment rates and net migration flows, results from the entire multiple regression model will be explored further below.

Figure 4: Scatter Plot of the Relationship Between Migration and Unemployment



Source: Data comes from a sample of the 2019 ACS 5-year estimates and from the Kentucky Center for Statistics. This sample is limited to population estimates in Kentucky counties for the years 2009-2019. N= 1,320

According to the results of the regression shown below, an increase of 100 percentage points in annual unemployment rates corresponds to an increase in the net migration flow estimate by population of 9.01%, holding all other variables constant. Based on the above regression results, there is evidence to reject the null hypothesis that there is no relationship that can be examined between net migration flow estimates and annual unemployment rates. Since the observed test statistic for unemployment is less than 0.05, the significance level, the coefficient is considered statistically significant. The above regression results also show a statistically significant result for the following variables: High School Graduate or Higher, Poverty Rate, Accommodation and Food Services, Other Services, and Retail Trade. On an economic scale,

the significant results of this regression are rather large. In interpreting these results, it is important to understand what exactly this means for Kentucky counties and what should be learned from these results. Since this regression was run with individual data, but at the county level, it may be difficult to make sense of all the results. For example, having a statistically significant result in terms of the variable “High School Graduate or Higher” can show a positive relationship between high school graduation and net migration flows by population. Basically, this means that an increase of 100 percentage points in High School Graduation rates for a county would correspond to a 6.25% increase in net positive migration flows by population, holding all other variables constant. A more educated county can lead to a county experiencing less of their population leaving, and quite possibly, an influx of people moving towards that county.

Figure 5: Table of Multiple Regression Results

Multiple Regression Results Predicting Net Migration Flows by Population

	<i>Coefficient</i>	<i>SE</i>	<i>t</i>	<i>p-value</i>	95% CI
Unemployment	0.0901264*	0.0277461	3.25	0.001	(0.03569, 0.14456)
EducationalAttain:					
High School	0.0624853*	0.021878	2.86	0.004	(0.01957, 0.10541)
Associates	-0.0016111	0.042557	-0.04	0.970	(-0.08510, 0.0818)
Bachelors	0.0653345	0.0416667	1.57	0.117	(-0.01641, 0.1470)
Poverty Rate	0.037611*	0.0163899	2.29	0.022	(0.00546, 0.06976)
PrimeWorkAge	0.0298857	0.0331421	0.90	0.367	(-0.03513, 0.09493)
MetroArea	0.0005485	0.0018207	0.30	0.763	(-0.00302, 0.0041)
AccFoodServ	0.0029109*	0.0014712	1.98	0.048	(0.00002, 0.00580)
Construction	0.0017828	0.0013797	1.29	0.197	(-0.00092, 0.0044)
Finance/Insurance	-0.0025748	0.0013164	-1.96	0.051	(-0.005, -0.000008)
Health Care	0.0001513	0.0015156	0.10	0.920	(-0.00282, 0.0031)
Manufacturing	0.001502	0.001502	1.06	0.291	(-0.00136, 0.0045)
Other Services	-0.0041451*	0.0013877	-2.99	0.003	(-0.00687, -0.0014)
ProTechServices	-0.0012855	0.0014319	-0.90	0.369	(-0.00409, 0.0015)
Retail	-0.0040351*	0.0013602	-2.97	0.003	(-0.00670, -0.0014)
Wholesale	0.0004834	0.0013798	0.35	0.726	(-0.00222, 0.0031)
Constant	-0.0847824*	0.0237419	-3.57	0.000	(-0.13136, -0.0382)

N=1,320.

* p<0.05

These results also show a positive relationship between Poverty Rates and Net Migration Flows by Population. Holding all other variables constant, an increase of 100 percentage points in annual poverty rates for a county corresponds to an increase in net migration flow by population estimate of 3.76%. This is a result that while significant in this sample, may not make sense in the grand scheme of things. What this result shows is a positive relationship between county level poverty rates and net migration flow estimates, meaning that an increase in poverty rates leads to an increase in net migration flows for that county. In general, this result seems to be a little bit on the opposite spectrum, whereas many would think that a county with an increase in poverty rates should see more of their population migrate away. This model also included a series of dummy variables meant to show the economic make-up of each county in terms of major industry sectors. The industries included were included because these encompass the most important industry sectors for the state of Kentucky, as determined by the Kentucky Department of Economic and Workforce Development. The results above show the statistical effect that the presence of these industries in a county will have on the estimated migration flow observed in those same counties. For example, variables such as “Accommodation and Food Services” and “Manufacturing” show a positive relationship with the response variable, net estimated migration flows, basically meaning, that a county that whose major industries include those variables will see a positive estimated migration flow. On the other hand, industry variables such as “Other Services” and “Retail” have coefficients with negative signs, corresponding to a negative relationship between these industries and estimated net migration flows.

Residuals

The regression analysis explained above results in a regression equation which can be used to predict the values of a response variable, Net Migration by Population, given the values of a set of independent variables. To go a step further, the difference between the predicted values

calculated by the regression equation and the actual values observed in the dataset can be measured to show the residuals for each value. In this sense, the calculation of the residuals would allow for a measure of how well the regression model is able to correctly predict the response variables in comparison to the actual observed values. The table below highlights a snapshot of the residuals calculated specifically for the regression equation developed for this analysis. Since the sample included 1,320 observations, the table below only includes those observations in which the standardized residuals measured at least 0.5 points above a residual value of 0 and at least 0.5 below a residual value of 0.

Figure 6: Table of Residual Values

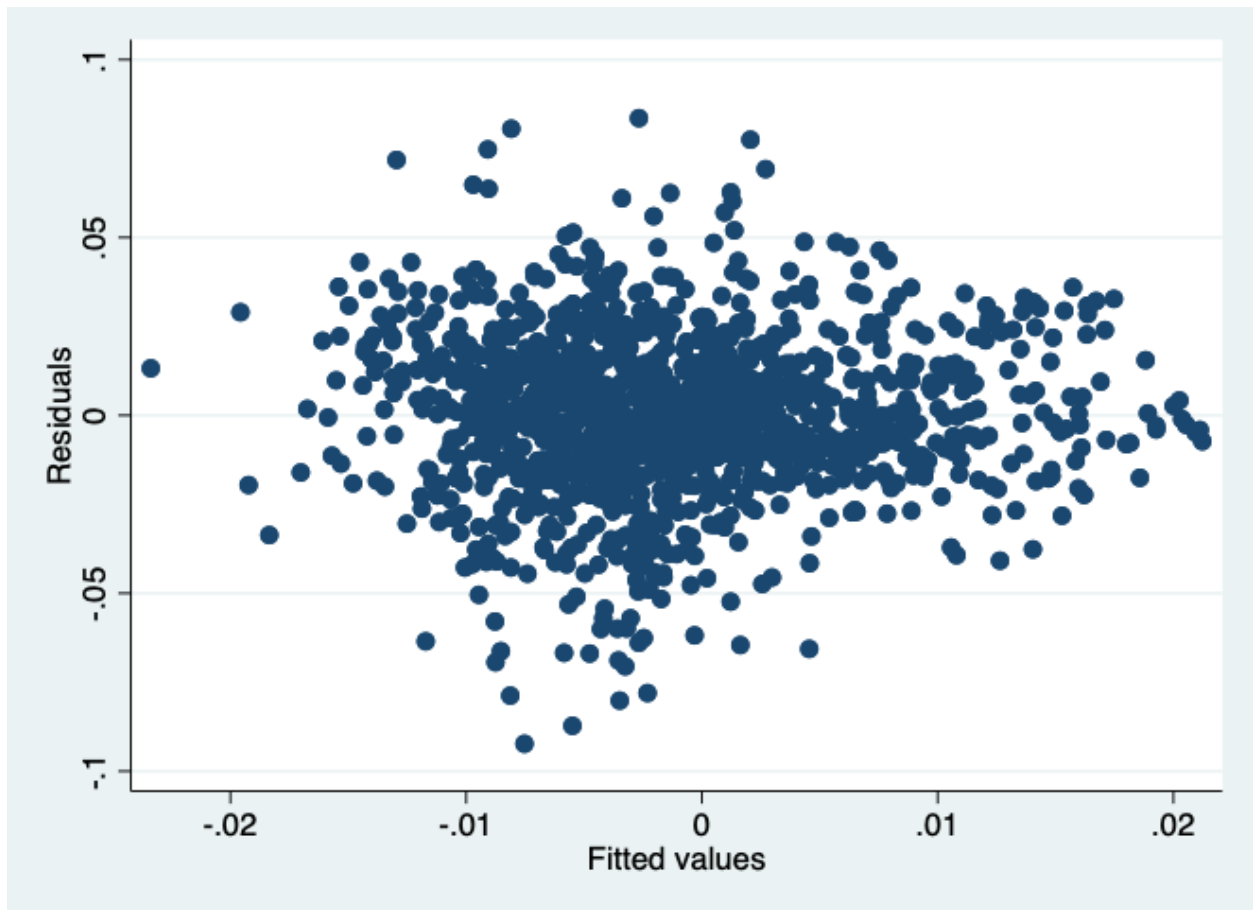
County	Year	Observed Values	Predicted Values	Residuals (Observed – Predicted)
Bracken	2013	-0.0650445	-0.0024653	-0.0625792
Bracken	2014	-0.0666109	-0.0026755	-0.0639354
Carroll	2018	-0.0643264	-0.0042843	-0.0600421
Carroll	2019	-0.0562957	-0.0053208	-0.0509749
Edmonson	2009	0.06112853	-0.0013469	0.0624755
Edmonson	2010	0.05392597	-0.002047	0.055973
Elliott	2009	0.08087112	-0.0026712	0.0835423
Elliott	2018	0.06146001	0.0012951	0.0601649
Elliott	2019	0.07954855	0.0020595	0.0774891
Hickman	2013	0.06567797	-0.0090822	0.0747602
Hickman	2014	0.07249467	-0.0080856	0.0805803
Hickman	2015	0.05884898	-0.0129524	0.0718014
Jackson	2015	-0.0781473	-0.0087528	-0.0693945
Jackson	2016	-0.0587971	-0.0056566	-0.0531405
Leslie	2017	-0.0868933	-0.0081293	-0.0787641
Leslie	2018	-0.0666996	-0.0087769	-0.0579227
Leslie	2019	-0.0737854	-0.0032533	-0.0705322
Magoffin	2015	-0.0511297	0.0012195	-0.0523492
Magoffin	2016	-0.0610747	0.0045536	-0.0656284

Magoffin	2017	-0.0629142	0.0016308	-0.0645449
Morgan	2011	0.04590833	-0.0054656	0.0513739
Owen	2019	0.05512679	-0.0096975	0.0648243
Owen	2012	-0.0748002	-0.0085267	-0.0662735
Owen	2014	-0.061169	-0.0041798	-0.0569892
Powell	2012	-0.053328	-0.0017247	-0.0516033
Powell	2013	-0.0600642	-0.0030276	-0.0570365
Powell	2014	-0.0803434	-0.0023074	-0.078036
Powell	2015	-0.0723986	-0.0035346	-0.068864
Robertson	2011	-0.0998256	-0.0075262	-0.0922994
Robertson	2012	-0.0725879	-0.005846	-0.0667419
Robertson	2013	-0.0716862	-0.0047595	-0.0669267
Robertson	2014	-0.0927364	-0.0054905	-0.0872459
Todd	2009	0.05462555	-0.0090481	0.0636737
Trimble	2016	-0.0621436	-0.0003108	-0.0618328
Union	2011	0.07193396	0.0027017	0.0692323
Union	2012	0.05797774	0.0009631	0.0570146
Union	2013	0.05338904	0.0013775	0.0520116
Union	2014	0.06393692	0.0012276	0.0627094
Union	2018	0.04463117	-0.0057742	0.0504053
Washington	2016	-0.0630839	-0.0031921	-0.0598918
Washington	2017	-0.0635161	-0.0035817	-0.0599345
Washington	2018	-0.0584464	-0.0041234	-0.054323
Washington	2019	-0.0836502	-0.0034861	-0.0801641
Wolfe	2019	0.05761432	-0.0033925	0.0610068
Wolfe	2009	-0.0752279	-0.0117157	-0.0635122
Wolfe	2010	-0.0598859	-0.0094577	-0.0504282

The results from calculating these residual values were then used to identify those counties in which would be considered “bright spots” in the data. Namely, these counties have a significantly better migration rate than what the regression model would predict, given unemployment, poverty, education levels, and the underlying economic composition of the county. Typically, the threshold used to determine significant results from the standardized residuals is higher than just 0.5 above and below a residual value of 0, however, as the scatterplot seen below depicts, most of the values calculated in this regression fall within 0.5

residuals from 0. Those values above and below this threshold of 0.5 are considered significant for this model.

Figure 7: Scatterplot of the Residuals



Source: Data comes from a sample of the 2019 ACS 5-year estimates and from the Kentucky Center for Statistics. This sample is limited to population estimates in Kentucky counties for the years 2009-2019. N= 1,320

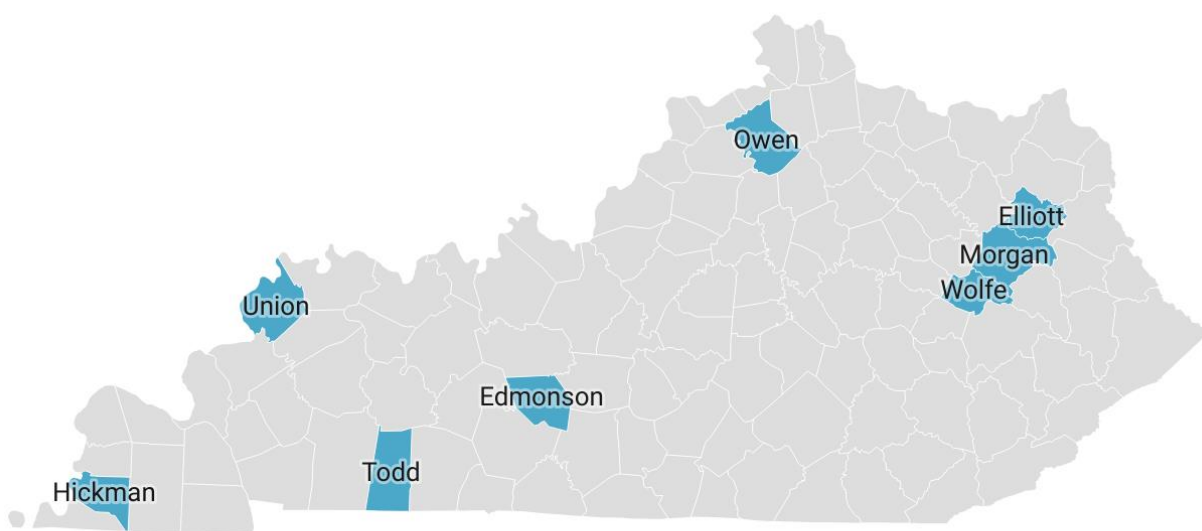
“Bright Spot” Counties

Based on the results displayed above from the calculation of the residual values, those counties in which had instances where their observed migration flow estimates were significantly higher than what the regression model would predict. Those values highlighted in green in the above

table represent these significant instances and thus those counties are considered “bright spots” within the sample. The map included below highlights these “bright spot” counties.

Figure 8: Map of “Bright Spot” Counties

"Bright Spot" Counties



Created with Datawrapper

As the graph depicts, these “bright spots” counties are spread out almost evenly throughout the state covering both Eastern and Western Kentucky. These few counties, despite battling unfavorable economic conditions, have been able to perform better than predicted, finding success in stemming the flow of outward migration from their counties. The question then turns to why these specific counties have found this success? In order to provide some evidence towards answering this question, interviews were conducted with public officials associated with these “bright spot” counties to get a better sense of what these counties have done to remain attractive to citizens despite their unfavorable economic conditions.

From a big picture perspective, I offer a few possible explanations for why these counties have performed better than expected in terms of migration flows. The expansion of broadband internet access across the state of Kentucky has allowed for even the most rural households to receive fiber optic internet services to their homes providing for more opportunity. Citizens on both ends of the state are able to provide themselves an education or grow their own businesses through e-commerce from their own couches without the need to move to a more urbanized county. In Eastern Kentucky, companies such as Mountain Rural Telephone Cooperative and Highland Telephone are working to provide this fiber optic connection to every household so that Appalachian citizens do not need to move away to discover better opportunity. However, the modern landscape, and the state's commitment to investment in the expansion of broadband internet, have increased the opportunity for remote work, online education, and a business platform vested upon e-commerce that can create success for an individual from their home.

In addition to the state investing in the expansion of broadband internet access, the expanded offering of Graduate and Professional programs at many of the state's regional higher education institutions have allowed for better educational opportunities to be available statewide rather than centralized at the larger colleges and universities in Kentucky. Many of these regional institutions such as the University of Pikeville, Morehead State, or Murray State have been able to expand their Graduate and Professional program offerings due to previous success which has opened the doors for more educational opportunities in these areas that once were lacking, forcing those searching for an advanced education to move elsewhere. Even prior to college, educating the younger people about the opportunities available to them in their community and incorporating them into the community at an early age allows for them to feel as if you do not have to leave to find success.

Further more, investments into the expansion of many of the state's regional health care providers coupled with a temporary expansion in access to Medicaid and other health care insurance options have increased the access to healthcare for many Kentuckians. With this increase, healthcare providers such as Pikeville Medical Center and the Appalachian Regional Hospital system have been able to expand into some of the state and region's largest providers to serve their constituents more effectively. Separate from the healthcare industry, an increase in recreational and tourism opportunities, including an investment in the Kentucky State Park system, have allowed for many of these counties to appear attractive to citizens. In Eastern Kentucky, attractions such as the Big South Fork Ridge or Red River Gorge have become major tourism pulls for these communities, while the Kentucky Lake and Land Between the Lakes areas have remained a popular destination in Western Kentucky.

The final two explanations explored to why these counties have found success in stemming the flow of outward migration is the success of the surrounding counties and the idea of pride, comradery, and place attachment, especially in Eastern Kentucky. While not necessarily a direct effect to the county, the success or failure of those surrounding counties can have an equal effect on the economy. The map above shows three counties, Elliott, Morgan, and Wolfe that all border each other and all have found the same success in performing better than expected in terms of net migration flows. These counties are able to feed off each others success and the success of the other counties surrounding them to retain their populations at a rate that is better than expected. Edmonson County, while not surround by other "bright spot" counties is situated near both Bowling Green and Elizabethtown that are expanding at high rates thanks to timely investments that have created hundreds, nearly thousands, of new jobs and has sparked a new fire into these communities economies. Shifting gears, these successes can further be explained, especially in Eastern Kentucky, due to an elevated sense of pride and place attachment of one's hometown in the younger generation. As discussed in the Literature

Review section of this paper, there is a growing sense of place attachment throughout the Appalachian region, including Eastern Kentucky, where these younger people grow a sense of pride and commitment to make their own mark on their hometown instead of moving away to find opportunity. In these more rural sectors of the country and in Kentucky, people feel a better sense of comradery that they may not get in a bigger city setting. Previous studies have shown that while young people may make their decisions on where to live based on where will provide them the best employment opportunity that fits their needs, those who grew up in a more economically challenged community, such as many of the “bright spot” counties identified in this analysis, tend to want to stay in their home county or region due to a high sense of attachment and a desire to strengthen their own community.

Conclusions and Recommendations

In conclusion, the relationship between annual unemployment rates and net migration flow estimates for Kentucky’s counties show an interesting result. Kentucky is a state predominantly consisting of rural areas that unfortunately continue to witness high unemployment rates and poor economic conditions. This has led to many issues for these counties, one of which being a decline in the working age population, that many other counties with lower unemployment rates and subsequently more economic opportunity do not have to deal with. This phenomenon is seen not only across the state but can be said to be true across the country as well. However, this analysis has identified that there are a few counties across the state of Kentucky that, despite their poor economic conditions, these outward migration flows have been stemmed. These “bright spot” counties have been able to retain, or even increase, their populations over time through a variety of different ways and for a variety of reasons. At the heart of this research is the question of why these counties have been more successful than others in retaining their young people despite existing economic hardships?

The counties identified in this analysis as “bright spots” have found their success through the investment in improving and expanding their existing infrastructure, while also being innovative and bringing in new industries to their regions. Expanding access to broadband internet and healthcare services, providing better quality and higher levels of educational opportunities, and developing new business opportunities have all allowed for these counties to become more attractive places for a citizen to both live and work in. The increase in tourism popularity of many of the state’s recreational attractions and state parks coupled with the success of many of the surrounding counties have created a sense of pride and place attachment, especially in Eastern Kentucky, inspiring more and more people to grasp opportunities in their own hometowns rather than leaving to succeed. Further research should be conducted in order to obtain a more unique sense into the individualized decision behind one’s migration patterns, however, this analysis provides a start. At the county level, it can be difficult to determine what factors influence an individual’s decision to stay, live, and work in one’s home county rather than move away for a better opportunity, so expanding upon this analysis with a focus more on the individual would provide a better context to the migration occurring and what makes a certain county particularly attractive to a person. However, from the interviews, it was suggested that policy makers focus on investing in programs such as broadband expansion, quality of education, and increased healthcare access to those areas that may be struggling with outward migration to help stem these negative flows. At the end of the day, these communities cannot survive without people, so they must invest in what will create the best possible quality of life for its citizenry and hone in providing their citizens with opportunities to develop not only themselves, but their communities, as well.

References

- Appalachian Regional Commission. (2018). Relative poverty rates in Appalachia, 2012–2016. <https://www.arc.gov/map/relative-poverty-rates-in-appalachia-2012-2016/>
- Barcus, H. R., & Brunn, S. D. (2010). Place Elasticity: Exploring a New Conceptualization of Mobility and Place Attachment in Rural America. *Geografiska Annaler Series B: Human Geography*, 92(4), 281–295. <https://doi-org.ezproxy.uky.edu/10.1111/j.1468-0467.2010.00353.x>
- Barcus, H. R., & Brunn, S. D. (2009). Towards a Typology of Mobility and Place Attachment in Rural America. *Journal of Appalachian Studies*, 15(1/2), 26–48.
- Burnett, Jennifer. (2017). Trends in Kentucky County Population. Kentucky Association of Counties. <https://kaco.org/articles/trends-in-kentucky-county-population>
- DaVanzo, Julie S., and Peter A. Morrison. (1981). Return and Other Sequences of Migration in the United States. *Demography* 18:85-101.
- Eller, R. D. (2004). Modernization, 1940-2000. In R. A. Straw, & H. T. Blethen (Eds.), *High mountains rising: Appalachia in time and place* (pp. 197–220). Urbana, IL: University of Illinois Press.
- Eller, R. D. (2008). *Uneven Ground: Appalachia since 1945*. Lexington, KY: University Press of Kentucky.
- Flynn, C.B., C.F. Longino Jr., R. F. Wiseman, and J.C. Biggar. (1985). The Redistribution of America's Older Population: Major National Migration Patterns for Three Census Decades, 1960-1980. *Gerontologist* 25:292-26.
- Hansen, N. M., & Fowler, G. L. (1974). Rural Poverty and the Urban Crisis: A Strategy for Regional Development/ Intermediate-Size Cities as Growth Centers: Applications for Kentucky, the Piedmont Crescent, the Ozarks, and Texas/ Location Preferences, Migration, and Regional Growth: A Study of the South and Southwest United States. *Annals of the Association of American Geographers*, 64(4), 580–583.
- Harris, Jordan. (2017). Tennessee Counties Along Kentucky Border Are Gaining Wealth. Kentucky Counties Are Losing It. Pegasus Institute. <https://www.pegasuskentucky.org/post/2017/09/15/tennessee-counties-along-kentucky-border-are-gain-wealth-kentucky-counties-lose-are-it>
- Pollard, K., & Jacobsen, L. (2018, March 1). The Appalachian Region: A data overview from the 2012-2016 American Community Survey. Report. <https://www.arc.gov/report/the-appalachian-region-a-data-overview-from-the-2012-2016-american-community-survey/>

Sears, J. (2022). Working out Place: Processes of Migration Decision Making and Resistance in Appalachian Kentucky. *Journal of Rural & Community Development*, 17(4), 51–72.

Shaping Our Appalachian Region. (2016). 2016 Impact Report.

<https://soar-ky.org/wp-content/uploads/2021/03/SOAR-2016-Impact-Report.pdf>

United Nations. (2014). World urbanization prospects: The 2014 Revision, Highlights.

Department of Economic and Social Affairs, Population Division.

<https://www.un.org/en/development/desa/publications/2014-revision-world-urbanization-prospects.html>

University of Kentucky. (2023). Kentucky Annual Economic Report. Center for Business and Economic Research, Gatton College of Business and Economics.

White, S. E. (1987). Return Migration to Eastern Kentucky and the Stem Family Concept.

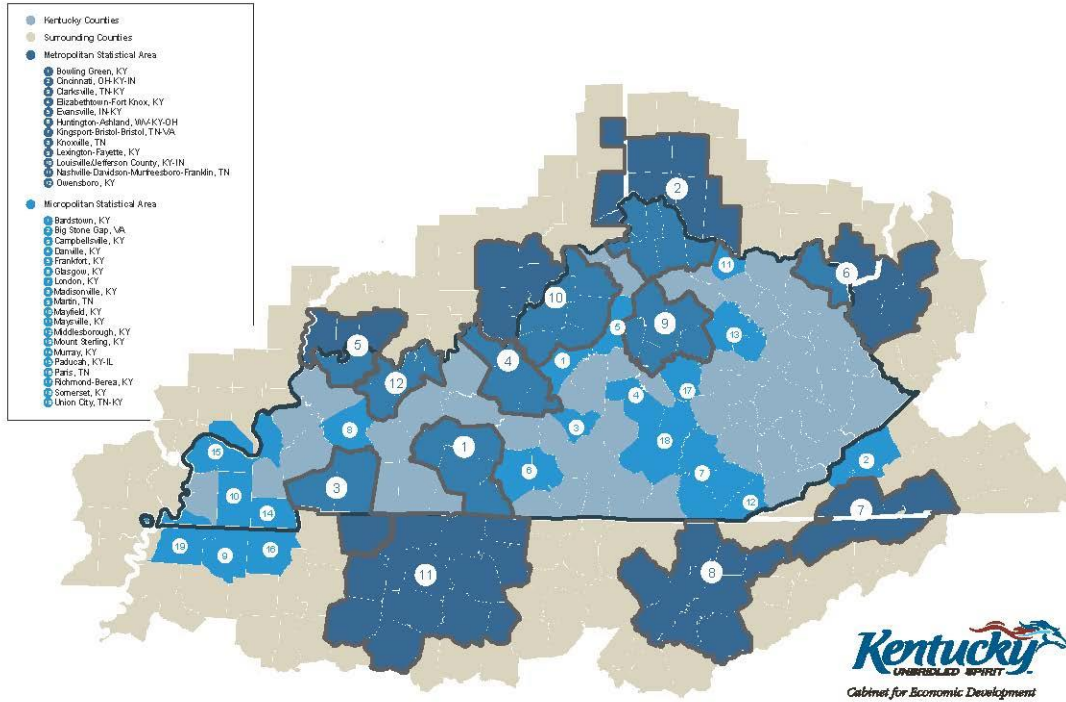
Growth & Change, 18(2), 38. <https://doi-org.ezproxy.uky.edu/10.1111/j.1468-2257.1987.tb00454.x>

Williams, J. A. (2002). *Appalachia: A history*. Chapel Hill, NC: The University of North Carolina Press.

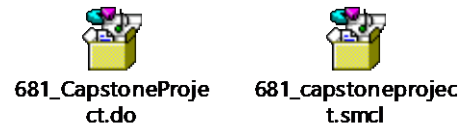
Appendix

Appendix 1: Map Showing Metropolitan Statistical Areas in Kentucky

Metropolitan & Micropolitan Statistical Areas



Appendix 2: Stata .do and .log files



Appendix 3: IRB Approval Letter



EXEMPTION CERTIFICATION

IRB Number: 85256

TO: James Stein, Master's in Public Administration
Graduate School
PI phone #: 2703135289
PI email: james.stein1@uky.edu

FROM: Chairperson/Vice Chairperson
Nonmedical Institutional Review Board (IRB)

SUBJECT: Approval for Exemption Certification

DATE: 2/15/2023

On 2/14/2023, it was determined that your project entitled "*Examine the Relationship Between Unemployment Rates and Migration Flows in Kentucky Counties*" meets federal criteria to qualify as an exempt study.

Because the study has been certified as exempt, you will not be required to complete continuation or final review reports. However, it is your responsibility to notify the IRB prior to making any changes to the study. Please note that changes made to an exempt protocol may disqualify it from exempt status and may require an expedited or full review.

The Office of Research Integrity will hold your exemption application for six years. Before the end of the sixth year, you will be notified that your file will be closed and the application destroyed. If your project is still ongoing, you will need to contact the Office of Research Integrity upon receipt of that letter and follow the instructions for completing a new exemption application. It is, therefore, important that you keep your address current with the Office of Research Integrity.

For information describing investigator responsibilities after obtaining IRB approval, download and read the document "[PI Guidance to Responsibilities, Qualifications, Records and Documentation of Human Subjects Research](#)" available in the online Office of Research Integrity's [IRB Survival Handbook](#). Additional information regarding IRB review, federal regulations, and institutional policies may be found through [ORI's web site](#). If you have questions, need additional information, or would like a paper copy of the above mentioned document, contact the Office of Research Integrity at 859-257-9428.

see blue.

405 Kinkead Hall | Lexington, KY 40506-0057 | P: 859-257-9428 | F: 859-257-8995 | www.research.uky.edu/ori/

An Equal Opportunity University

Appendix 4: Recruitment Email

Dear _____,

My name is James Brady Stein and I am a Master's of Public Administration student at the University of Kentucky's Martin School of Public Policy. The reason I am emailing you today is to ask whether you would be willing to participate in a short interview via Zoom regarding your county.

The purpose of my study is to highlight the attributes, programs, and initiatives that some Kentucky county leaders have implemented to maintain or possibly even grow their population despite high unemployment rates and unfavorable economic conditions.

As a county official in one of these counties that have successfully stemmed the flow of outward migration, you are being asked to participate in this short interview in order to highlight the effective strategies and programs that have kept your county attractive to your citizens or have been successfully in recruiting citizens to move to your county.

An Informed Consent form is attached to this email and will further explain the key information involved in this study. If you are willing to participate, please respond to this email with your signed consent form and we will set up a time to meet virtually via a Zoom meeting.

Thank you so much and have a great day,

James Brady Stein

Appendix 5: Stamped IRB Consent Form for Interviews



85256_Stamped
Consent Form_8574