THE IMPACT OF THE 2008 ECONOMIC RECESSION ON EDUCATIONAL FUNDING AND INEQUITY

By

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ABSTRACT

There has long been controversy about educational funding and whether public school funding is proportionate across school districts in the United States. The 2008 recession had lasting effects on many parts of the economy, one of which is education. To study this effect, I gather data from every public school district in the United States with over 15,000 students between 2005 and 2016 to examine changes around 2008. Data was collected for: state, total funding, local funding, total expenditures, poverty rate, expenditure per pupil, and number of students. The data sets were combined to measure the variation over time and between socioeconomic groups in total funding, local funding, and total expenditures. I hypothesize that the 2008 recession will negatively affect education funding, with distinct differences across socioeconomic groups. Results indicate that local funding was the only affected funding source. Future research could track the impact of the COVID-19 pandemic shutdown across the United States on education funding and educational inequity.

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TABLE OF CONTENTS

Introduction: Rationale

People have criticized educational funding for years because they believe property taxes provide the main source of revenue for local public schools. The common belief is there are education funding discrepancies between low socioeconomic schools and high socioeconomic schools across the country. Research supports that public schools in high socioeconomic neighborhoods offer key opportunities such as rigorous curriculums, college preparation courses, and a student body that wants to go to college. While in comparison, public high schools in low socioeconomic neighborhoods often go without these opportunities, possibly leading to inequities and achievement gaps (Hattie 106).

Educational funding depends on the economic well-being of the United States economy. When the 2008 Recession hit, it is believed that education funding for K-12 public schools across America began decreasing exponentially. Research shows that some states never recovered to pre-2008 Recession state budgets (Leachman et al. 15). The goal of this paper is to better understand the effects of shocks to education funding levels and the impact on educational inequity. The results will help government and school officials prepare for the long-term influence on educational funding after the Coronavirus or other economic shocks.

The conversation about education funding has always been of interest to me because I experienced a difference personally. When I was in high school, I attended a public high school in a middle-to-low socioeconomic area and another in a high socioeconomic area. When attending the public high school in a middle-to-low socioeconomic area, I believed that I had a lot of opportunities and guidance regarding college. However, when I transferred to a high school in a high socioeconomic area halfway through my junior year, I realized that I was very wrong. My new high school had a lot of college preparatory opportunities such as office hours,

college counselors, challenging courses, and advanced in-classroom technology. I found myself drowning in an advanced curriculum vastly different from my previous classes and frightened to find out that my GPA and extra curriculars were not as competitive for college as I had thought. While I ended up thriving at this new school and accepted admission to the University of California, Riverside, other students never have the opportunity to experience the privileges I was able to.

Today, the COVID-19 pandemic has caused many students to fall behind. As schools transferred online and our lives vastly changed, resources disappeared leading to the potential increase in the achievement gap as educational funding decreases. This is why I analyzed the variation in educational spending from 2005 to 2016, investigating the effects of the 2008 recession on educational inequity in terms of education funding.

People often consider education as the backbone of the American economy. In economics, there is a term called human capital: the concept that humans are the number one asset in production because of their skills and knowledge. Education can increase ones' human capital, therefore opening up more jobs and more income. In the end, more income for more people means more wealth and production for the entire American economy. Government and public-school officials need to enact policies that protect the educational funds of future and current American generations, certifying them with a sufficient and equitable education. This will not only help the economy but will also keep the COVID-19 pandemic and future recessions from decreasing output for years to come. Overall, my research project will identify areas of educational funding that need to increase due to the damage the 2008 Recession caused and how that impacts children directly in terms of equitable education.

Introduction: Literature Review

This project is a small representation of the potential link between socioeconomic status and education. In the past, many studies have researched the need for more educational funding and the impact of socioeconomic status on various measures of education success.

Previous research shows there is a positive relationship between the socioeconomic status of parents and student achievement in terms of test scores (Jang and Reardon 1). This finding illustrates a growing achievement gap starting in elementary school and increasing exponentially through middle school even during the most stable of business cycles. Whereas, during unstable business cycles such as the 2008 Recession, the importance of income inequality concerning educational inequity is of even greater importance. Research claims that the 2008 Recession led schools to struggle that depended greatly on the state government for funding. Whereas schools primarily funded by local revenues thrived (Evans 1). With that, the educational funding data from before and after the 2008 Recession should differ across states due to differing formulas of education funding but still have variation explained by educational inequity factors such as poverty levels and total expenditures.

While observing these factors in my project, I will study data from public school students in kindergarten to high school whereas most research focuses only on elementary school students. Observing the factor of income inequality and the variation before and after the 2008 Recession can contribute to my history of educational funding discrepancies and help lead my research to the possible educational funding issues that may stem from the Coronavirus pandemic.

Overall, I want to study the variation before and after the 2008 Recession in educational funding between public schools in low socioeconomic areas and high socioeconomic areas.

Hopefully, teachers and policymakers can use my research to increase educational equity for American students by counteracting or diminishing any inequities.

Introduction: Setting

I am going to study the history of education funding between 2005 and 2016 for public districts in the United States that have more than 15,000 students because I want to find out the impact of the 2008 recession on educational spending. Specifically, I want to create a comprehensive history of the changes in three key areas: total funding, local funding, and total expenditures. To supplement the original data I will also include individual data for Arizona, Oklahoma, and Kansas. Then I will analyze the variation in these areas concerning the poverty rate, expenditure per pupil, and students. The results may uncover potential educational funding inequities between public schools in low socioeconomic and high socioeconomic areas. First, I will address the issue of decreased education funding before and after the 2008 Recession. Second, I will address the variation in the three key funding areas when the data for the poverty rate, expenditure per pupil, and students are analyzed. Lastly, I will address the issue of why there is a funding discrepancy and how this discrepancy impacts educational inequities.

Methods and Materials

The National Center for Education Statistics [NCES] provided me with data regarding revenue, expenditures, poverty rate, and Title I allocation for all public schools across the United States, with more than 15,000 students from 2005 to 2016. Additionally, the United States Census Bureau [USCB] provided public elementary-secondary education finance data for public

schools in Arizona, Kansas, and Oklahoma from 2005 to 2016.[1] These data sets were downloaded using excel and imported into Stata SE 16.0. Variables that were used from the NCES data include school district, state, total funding, local funding, total expenditures, poverty rate, expenditures per pupil, and year. Variables that were used from the USCB data include local revenue and current expenditures in education.

I generated four new variables. First, a new variable measuring the number of students in each district by multiplying total expenditures by 1,000 then dividing the answer by expenditures per pupil was derived for each set of data from 2005 to 2016. Second, a new variable was created measuring local funding per student by dividing local funding by the number of students in each district to normalize the variable. Third, a new variable was created measuring average poverty which assigned each district an average poverty rate: 17.27 is the median poverty rate between all districts. Lastly, a dummy variable was created measuring the poverty category of each district. If a district has an average poverty rate above the median of 17.27, then they are labeled a high poverty district with a poverty category equal to 1 and if a district has an average poverty rate below the median of 17.27 then they are labeled a low poverty district with a poverty category equal to 0. These distinctions and calculations completed the data set from NCES used in this paper. The data from the USCB did not require any calculations or distinctions.

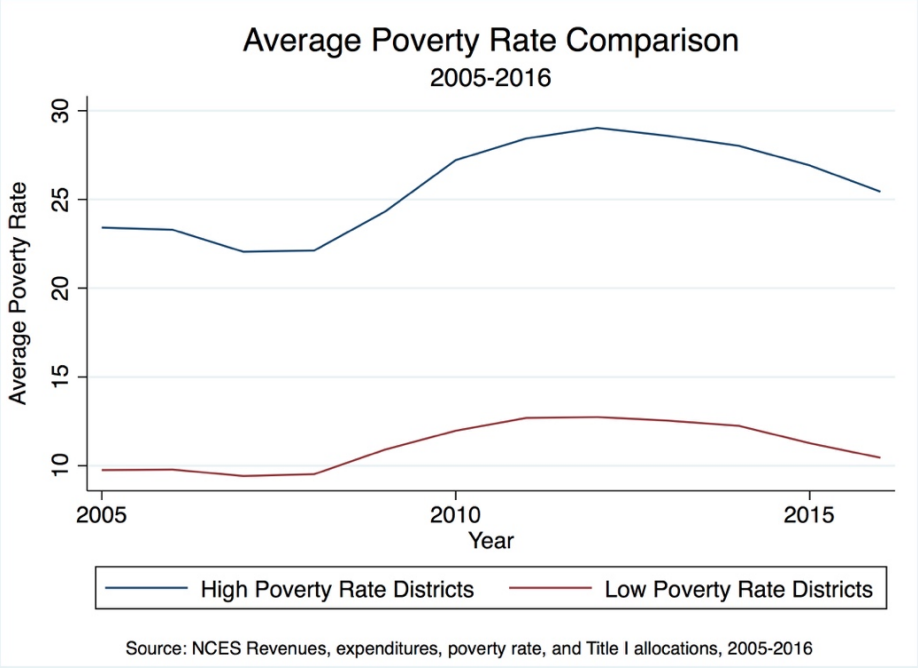
To analyze the data from NCES, I collapsed at the state and poverty distinction level. This yields an average level of poverty rate, expenditure per pupil, children, and local funding per student for high poverty districts and low poverty districts in each year from 2005 to 2016. This function categorized the data to help easily distinguish the difference in high and low

[1] Data is missing for Modesto City High from 2005 to 2010 and from 2015 to 2016, for Shawnee Mission from 2014, and for Montebello Unified in 2015. In addition, data reported for Modesto City High and Modest Elementary were merged into Modesto City from 2011 to 2014.

poverty districts over time, specifically regarding the variables of interest. After this, four graphs were created showing the relationship between each average variable and the impact over time to high poverty districts versus low poverty districts. The graphs show average expenditures per pupil, average local spending per student, average poverty rate, and the average number of students per district.

Data and Results

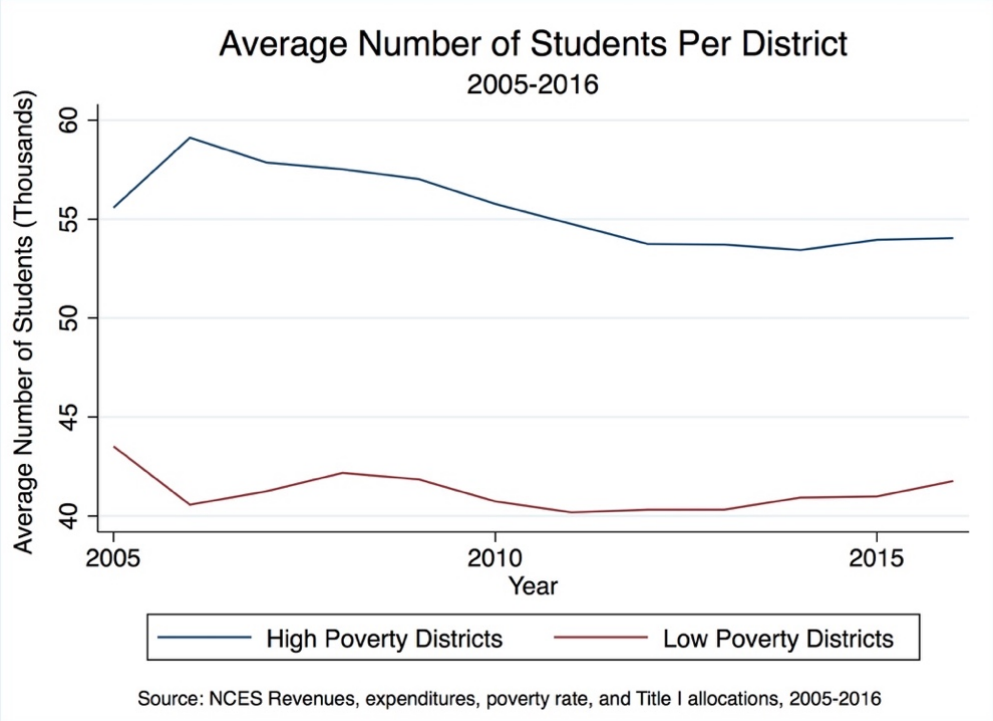
Figure 1.



Examining the results in Figure 1 allows a clear picture regarding poverty levels and socioeconomic differences in high versus low poverty school districts. The gap in average poverty levels has been distinct for years, starting with an almost 12-percentage point gap, and increasing over the years. Preexisting levels of income inequality possibly stemming from the technological advances in the 1990's could explain the 12-percentage point gap in 2005. Most notably poverty levels in both high poverty school districts and low poverty school districts were

decreasing until the 2008 Recession hit. After the 2008 Recession, average poverty levels in high versus low poverty districts grew to an almost a 15-percentage point gap. As so many people lost their jobs and businesses closed poverty levels did not start to decrease until 2012. But what appears to matter most about the growth is that the high poverty school districts were already so far above the low poverty districts in 2005. That being said income inequality and therefore inequity across districts only got worse after the 2008 Recession. This finding supports my hypothesis in that differences across socioeconomic groups are present after the 2008 Recession, even if they were present before.

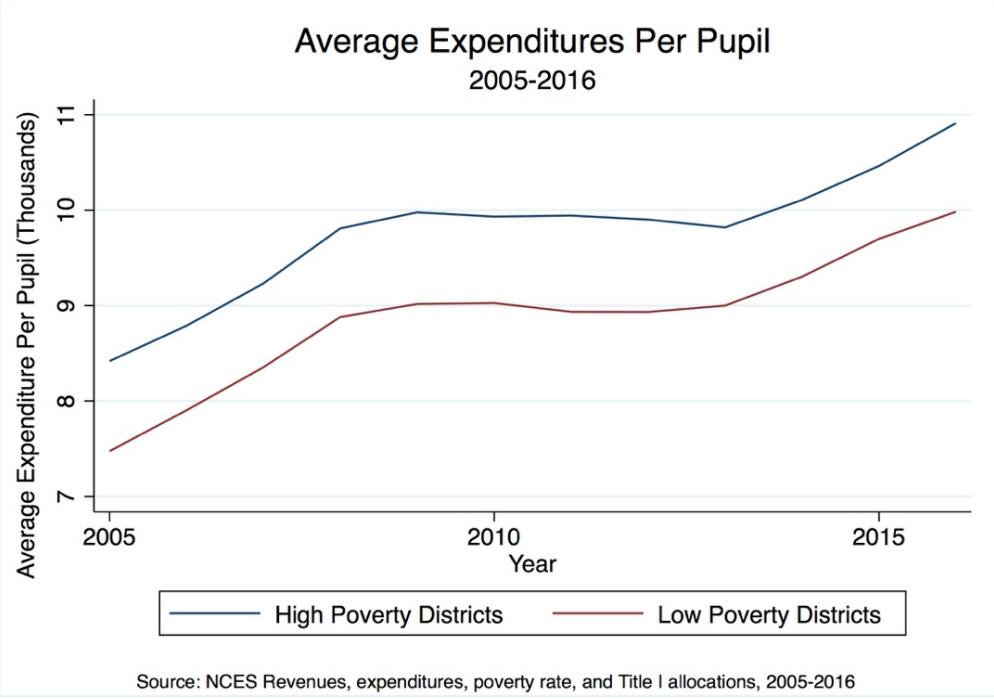
Figure 2.



While Figure 1 represents the relationship between poverty rates and school districts, Figure 2 helps illustrate what further aspects may separate high poverty districts and low poverty districts. Figure 2 shows a decrease in students at high poverty districts between 2006 and 2016 of about 4,000 students on average. Whereas students at low poverty districts increased between 2006 and 2016 of about 2,000 students on average. In 2005, the gap between students in high

poverty districts and students in low poverty districts is almost 13,000 students on average, a number that grows to about 15,000 students after the 2008 Recession. Perhaps in 2007 families were gaining income still and as a result moving their children into low poverty districts. This could explain the influx of students at low poverty districts prior to the 2008 Recession. Furthermore, the 2008 Recession led to many house foreclosures and as a result displaced families could explain the efflux of students from high poverty districts and low poverty districts across the country, after the 2008 Recession. Most importantly Figure 2 shows an overwhelming difference in the average number of students signaling that high poverty school districts needed more help after the 2008 recession than their high socioeconomic counterparts. Moreover, Figure 2 supports differences between socioeconomic groups as well by showing the potential deficient in terms of student teacher ratios and school resources for low poverty districts.

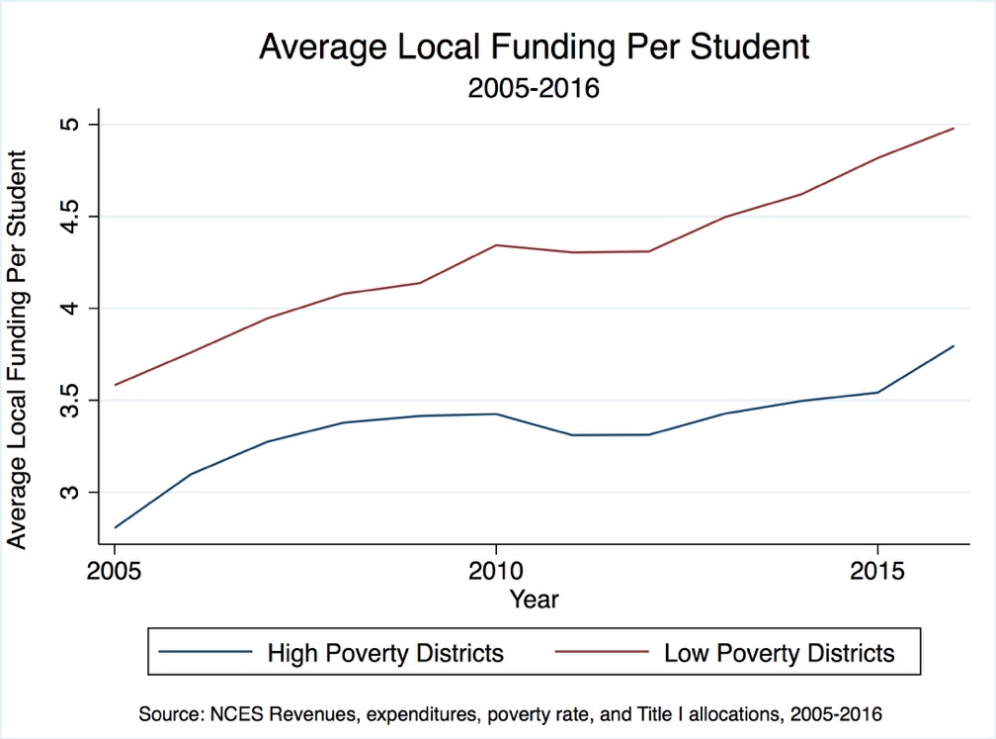
Figure 3.



Taking a look at the data provided in Figure 3 there is a steady gap of about 1,000 dollars spent between average expenditures in high poverty districts and low poverty districts. This gap

appears to exist long before 2005, due to most state laws ensuring that education funding formulas provide more funding for expenditures per pupil in high poverty districts. While this ensures a small buffer of support for students in high poverty districts it does not mean there must be equitable and adequate education funding provided to these students. Additionally, it is shown that high poverty districts, on average, slightly increased expenditures per pupil from 9,800 to 10,000 before tapering off after the 2008 recession. Similarly, low poverty districts, on average, slightly increased expenditures per pupil from 8,800 to 9,000 before tapering off after the 2008 recession. Then in 2012, both high and low poverty districts began increasing their average expenditures per pupil at almost identical rates, keeping the 1,000-dollar gap steady. These trends result in a necessary conclusion that from 2005 to 2016 a source of educational funding must have kept the gap almost constant and continued to provide enough funding for high poverty districts to give their often-low-income students the materials they need. To show this trend in a graph of all the states in the U.S. means the majority of the U.S. states must have tried their hardest to keep their expenditures per pupil steady before, during, and after the 2008 Recession. Figure 3 shows information that begins to question my original hypothesis education funding after the 2008 recession will not equate to that of before the recession.

Figure 4.



The findings in Figure 4 build upon the data in Figure 3, revealing where part of the funding for education expenditures comes from. Specifically, average local funding per student is shown for high poverty districts and low poverty districts. The gap in average local funding starts with a difference of about 0.8 units and continues to increase after the 2008 recession, leading to about a 1.3-unit gap. Feasibly, the gap between high and low poverty districts is due to income inequality which funds the local funding revenue through property tax. Using property taxes as the number one source of funding for local education funds builds in an aspect of inequitable and insufficient funds for high poverty school districts before state and government funds are even allocated. Then as the 2008 recession began, local funding in high poverty districts appeared to plateau at 3.4 before decreasing in 2010. While local funding in low poverty districts increased after the recession to 4.3 and began to plateau in 2010. Figure 4 shows the average local funding per student, possibly answering our question from Figure 3. The data

shows an increasing gap between the two types of districts. But there must have been funding that kept the average expenditures per pupil steady. Additionally, average local funding for high poverty districts is not only below that of low poverty districts it also decreased about 3.4 units after the recession, whereas local funding in low poverty districts increased before plateauing. All in all, this data allows us to infer that other sources of funding, such as state and federal funding made up for local funding and are responsible for the steady rate of average expenditures per pupil in high and low poverty districts.

Figure 5.

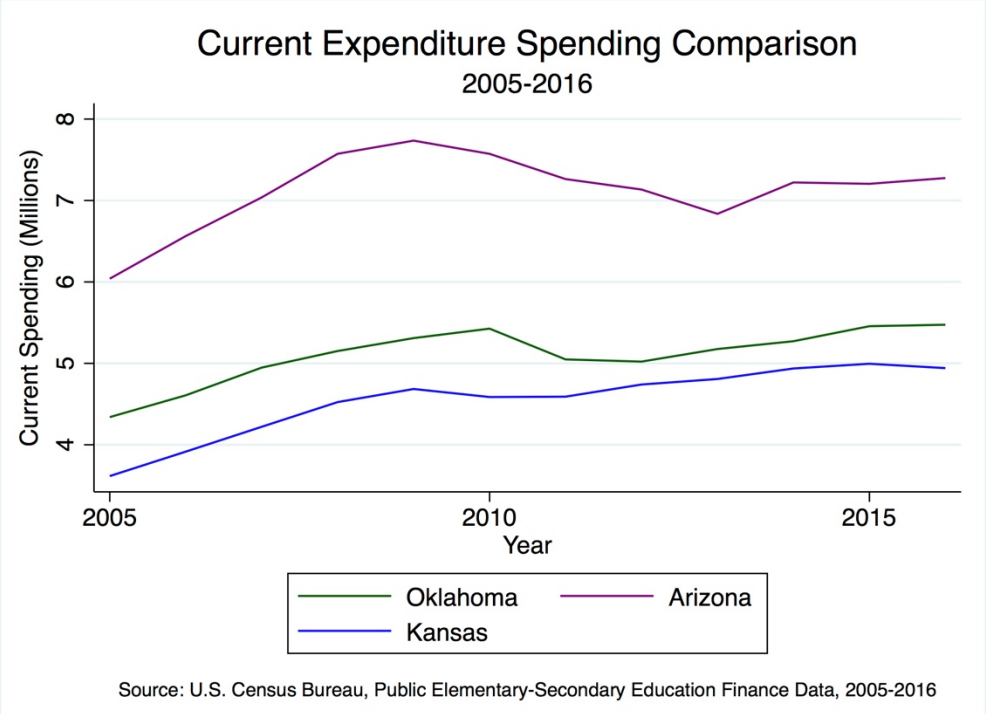
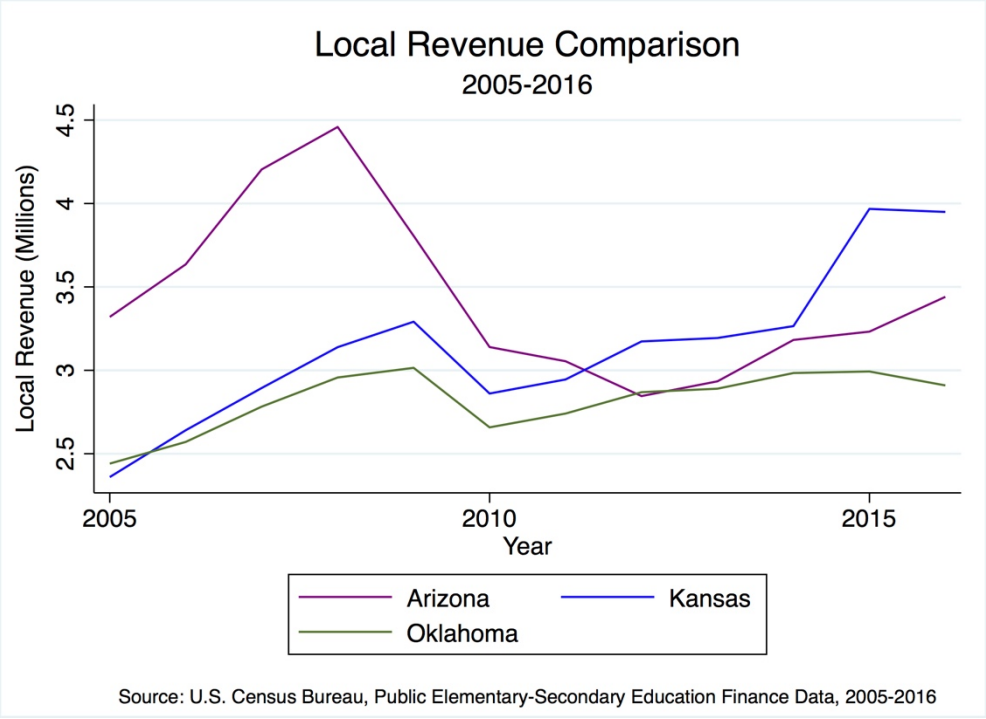


Figure 5 includes the first look at data from the USCB, detailing more specific relationships between current expenditures and Oklahoma, Arizona, and Kansas. I chose to analyze data from these three states because I wanted to study states from different areas with different economies and different education funding formulas. Figure 5 shows current expenditures from 2005 to 2016 for all three states. Most notably are the sharp increases for each

state from 2005 until the 2008 recession hits. The impact on their expenditures is more noticeable than the changes in average expenditures per pupil across the United States from Figure 3, with Arizona decreasing expenditures by 0.6 million dollars by 2013. Perhaps Arizona, Oklahoma, and Kansas fund their schools differently than other states. Arizona shows the sharpest decrease in expenditures after the 2008 recession with about a 0.6 million dollar decline between 2008 and 2013. Oklahoma seems to feel the impact of the 2008 recession with a decline starting in 2010 by 0.4 million dollars. Lastly, Kansas slightly declines after the 2008 recession by about .1 million dollars and begins to increase in 2011. By 2016, Arizona was spending about 0.4 million dollars less, Oklahoma was spending about 0.2 million dollars more, and Kansas was spending about 0.4 million dollars more. Also, Kansas and Oklahoma ultimately increased their expenditures by 2016 with 0.4 million dollar and 0.2 million dollar increases, respectively. The variation within these three states is notable and fueled by different state education funding formulas.

Figure 6.



The data in Figure 6 accompanies Figure 5 by detailing a relationship between local revenue and Arizona, Kansas, and Oklahoma. This figure shows different behavior for each state but overall has a central trend of sharp declines in local revenue after the 2008 recession. In comparison to Figure 4, which shows changes in average local funding for districts across the United States, Figure 6 has sharper and more frequent changes in revenue. Arizona was exponentially increasing its local revenue until the 2008 recession hit and the housing bubble, causing a sharp decline of about 1.68 million dollars by 2012. Similarly, Kansas was increasing until 2009 where the data shows about a 0.45 million dollar decline by 2010. As well Oklahoma was increasing and declined by about 0.4 million dollars between 2009 and 2010. Overall, each state's local revenue changed differently between 2008 and 2016. Arizona's local revenue decreased by about 1.03 million dollars, Kansas' local revenue increased by about 0.75 million dollars, and Oklahoma's local revenue decreased by 0.11 million dollars. Essentially, I would make the same inference as in Figures 3 and 4 that another source of educational funds is making up for local funding to ensure expenditures are steady but in this case, the expenditures shown in Figure 5 are not steady and represent the same ups and downs as the local revenue in Figure 6. Specifically, Arizona's current expenditures in Figure 5 show an increase starting in 2013, the same year we see a slow increase in local revenue in Figure 6. Looking at Oklahoma, there is a decrease in expenditures followed by a slow increase, this goes hand and hand with the slow uphill increase of local revenue after the recession. Lastly, in Kansas expenditures in Figure 5 stayed steady after the recession and eventually began to slowly climb, probably propelled by the erratic increases of their local revenue from 2010 to 2016.

Discussion and Conclusions

I hypothesized that education funding after the 2008 recession will not equate to that of the education funding from before 2008, with differences across socioeconomic areas. To answer this question I assessed the data comparing high poverty school districts to low poverty school district and found some interesting findings. But after analyzing Figures 1 through 6, I believe that across the United States the 2008 recession negatively impacted local education funding, but most states were able to find other sources of funding to keep expenditures relatively steady for their students. The states that were not able to do so, such as Arizona, Oklahoma, and Kansas do so for different reasons and at varying degrees. What is important to note is the levels each state began at relative to where they ended. This can give key information about equitable education funding and expenditures. But to further analyze this idea and the overall hypothesis, I examine the funding regulations for Arizona, Oklahoma, and Kansas in terms of education funding.

Observing Arizona's spending formula there are a few key issues that stand out, as well as historical issues related to the 2008 recession. In particular, the funding formula for Arizona is quite old and does not properly account for new types of schooling such as charter schools and online schools (Rau and Cano). As these types of schools increased starting in the early 2000's the funding formula did not change with it, setting the state up for even more issues once the 2008 recession happened. The Arizona School Board Association claims that Arizona has cut 4.56 billion dollars in public school funding since 2009. While cutting education funding was not unexpected after the 2008 recession, Arizona continued to cut education funding for public schools, defunding many programs which make schooling an equitable system. Most prominently, the defunding of full-day kindergarten has cost school districts in Arizona about 1.5 billion dollars and the defunding of district additional assistance has cost school districts basic

classroom materials and needs such as air conditioners (“Arizona’s Budget Cuts”). To sum it up, school districts across the state of Arizona have been struggling since extreme cuts after the 2008 recession, and low-income students and their families are often benefiting from the defunded programs. I believe Arizona not only made educational budget cuts but made inequitable educational budget cuts due to an outdated funding formula.

In the state of Oklahoma, there is alarming information about their education funding formula in comparison to other states across the United States. In the years after the 2008 recession, Oklahoma has been recognized as the state making the largest budget cuts to education funding across the nation. This recognition has only grown more in the years after the recession. Oklahoma’s per-student expenditures have decreased 23.6 percent by 2019, which is a larger reduction than any other state in the U.S. The data is supported by needs that are not being met. Students go without textbooks and often do not have enough teachers to support the growing student population (Perry). Data from the NCES shows that there was a 112% increase in Oklahoma’s students participating in the free lunch program, a 47% increase in special education participation, and a 45% increase in English language learners by 2014. This is coupled with almost 75,000 more students in the 2021 to 2022 school year than in the early 2000’s. Lastly, in current years Oklahoma has continued to fall behind in spending per student, not just against states across the nation, but against all of the states in the region (“Oklahoma Education Facts”). In support of these claims, Oklahoma policymaker former senator Gary Stanislawski has tried to change legislature for Oklahoma school funding in the past and explained that the majority of public schools in Oklahoma are considered high poverty which costs more per student (Palmer).

Despite the claims made above Oklahoma policymakers have not listened. In similar nature, Kansas has been negligent with policy changes and has been in and out of the courtroom since Montoy v. Kansas which was filed in 1999. The case ended in 2006 when the legislature agreed to increase public school spending by 750 million dollars over the next three years. But then the negative economic shock was felt across the country, putting off legislatures plans and leading to extreme educational budget cuts. History returned and in 2010 a new lawsuit Gannon v. Kansas was filed claiming that educational spending was cut by 300 million dollars instead of increased as agreed upon on Montoy v. Kansas. The Kansas Supreme Court heard cases from 2014 until 2019 arguing two issues, one of inequity and one of inadequacy overall. The inequity issue called forward issues of high poverty school districts needing additional help from the state and access to educational opportunities equal to those offered in low poverty school districts. The inadequacy issue would impact every district in the state and require a large increase in educational spending overall (Llopis-Jepsen). By 2017 they were back in court after the legislature continued to cut funding and the Kansas Supreme Court ruled the educational funding formula unconstitutional claiming there was a correlation between inadequate funding and a decrease in student achievement (Sciarra). Finally, by 2019 the state of Kansas had come up with an adequate and equitable funding increase that was on track to be fixed by 2022. These drawn-out court proceedings were partially due to the 2008 recession, hopefully, Kansas has not repeated history with the 2020 pandemic.

Comprehensively, the states Arizona, Oklahoma, and Kansas had different outcomes in terms of educational funding due to the 2008 recession for three key reasons. First, differences can be attributed to outdated funding formulas that cannot account for the modern-day plethora of formats of public education. Second, inequitable access to education leads to unequal needs

for educational funding and resources. Third, policy lag due to business cycle trends leads to state policy and legislature having difficulty stabilizing the state economy and therefore, the overall budget. These three aspects lend themselves as potential explanations for the variation in educational funding in each of these three states. Furthermore, the analysis of these differences on an individual level for these three states shows that our comprehensive data across the United States can be biased by how each state's funding formula and state politics functions among other variables.

In conclusion, my initial hypothesis was that education funding levels after the 2008 recession would not equate that of the funding levels from before 2008, with differences in inequity between high poverty school districts and low poverty school districts. But ultimately, after I analyzed Figures 1 through 6 and of the supplemental data from Arizona, Oklahoma, and Kansas the results show a change in local education funding. Importantly, the data showed variation between high poverty and low poverty school districts across the United States in multiple areas. For example, after the 2008 recession, local funding had a wider gap while expenditures per pupil did not change. I conclude that most states were able to make up the difference from decreases in local funding with state and federal government funding to keep expenditures almost constant. But some states like Arizona, Oklahoma, and Kansas were struggling to maintain expenditures per-pupil due to more chaotic fluctuations in local funding revenue. The results of this study depend on the differences between individual state funding formulas and education policy. In closing, local education funding for public schools in the United States decreased, on average, after the 2008 Recession, leading to an increase in inequity between high poverty school districts and low poverty school districts. Future studies could compile more data for individual states to test specific state funding formulas and see how

specific factors of variation in the formulas could have impacted educational funding before and after the 2008 recession. This research could help policy and legislature realize what changes need to be made to ensure academic stability throughout all intervals of the business cycle, especially as the COVID-19 pandemic continues to disrupt public education in the United States.

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