

The Effects of Community-wide Job Loss on Student Achievement
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ABSTRACT

Understanding the impact of job loss on student achievement has grown increasingly important given the widespread job loss that occurred during the Great Recession. I evaluate the impact of county-level job loss within North Carolina on 9th grade students' enrollment and performance in classes that keep them on-track to attend college. I find that job losses that occur in the quarter immediately preceding the start of the school year increase student enrollment in courses that keep them on-track to attend college, on average. Conversely, I find that job losses that occur in the first calendar quarter decrease student performance in courses that keep them on-track to attend college. My findings demonstrate that state and local policymakers as well as school officials should be aware of the influence local economic events and crises have on students' enrollment and performance in courses that prepare them for college.

Introduction

Given the severity of the Great Recession, understanding the impact of economic downturns on student achievement has grown increasingly important. While past research has examined the impact of job loss on student test scores (Ananat et al., 2011a, 2011b), college enrollment (Coelli, 2010), and school performance (Rege et al., 2011), no research to date has examined the relationship between community-level job loss and students' college readiness. As a result of the positive relationship between college education and earnings (for example, Kenny et al., 1979), determining how job loss affects students' college readiness is a worthwhile consideration with policy implications. For example, if local economic crises reduce students' willingness or ability to prepare for college, school administrators might wish to intervene accordingly.

Estimating the effect of parental job loss on student achievement is complicated by parents' unobservable characteristics present in most cases that impact both the parents' probability of losing their jobs and the likelihood that their child will be successful in school. For example, a parent with health problems may be more likely to both lose a job and spend less time helping his or her child with schoolwork. In this case, the parent's health problems, and not him or her becoming unemployed, are potentially contributing to any decreases in school performance by the child.

In this paper, I use business closings and layoffs, rather than parental unemployment, to estimate the impact of community-wide job loss on student achievement. Past research (Jacobson et al., 1993 and Stevens, 1997) has demonstrated that business layoffs and closings can be viewed as resulting from macroeconomic forces and are independent of individual

characteristics, thereby eliminating the endogeneity inherent in using parental unemployment to estimate the effect of job loss on student achievement.

This paper contributes to a growing body of research investigating the impact of parental job loss on children's outcomes. This paper sheds light on how parental job loss affects high school students' decisions on whether to prepare for enrollment in higher education, as well as their performance in classes required for college enrollment. Policymakers can use evidence presented in this paper when attempting to combat the negative effects of local economic downturns.

My paper is organized as follows. First, I review the body of research examining the association between parental job loss and student outcomes. I include in the review the importance of education on individuals' outcomes, particularly focusing on future earnings, and why college readiness is an outcome worth considering. Also covered in my review are the channels through which job loss affects students, including those whose families are impacted by job loss and those whose families are not. Following my review, I offer two hypotheses on the impact of job loss on students' college readiness. I then describe the different data I use for my analysis, including job loss data reported by the North Carolina Employment Security Commission, county-level demographic information from the U.S. Census Bureau, and student achievement data from the North Carolina Education Data Research Center. Next, I present the analytical strategy used to evaluate the impact of community job loss on student college readiness. Finally, I review my findings in the last section of the paper.

Background

Impact of education on individuals' outcomes

Increases in education have been found to be associated a variety of positive outcomes for individuals, including reduced levels of risky behaviors, improved health outcomes, and increased civic participation, among other effects. For example, Rogers et al. (2012) found that increased education is associated with lower rates of smoking and alcohol consumption, increased exercise, and lower rates of obesity. Breierova and Duflo (2004) found a strong and significant effect of education on child mortality. Milligan et al. (2003) found that individuals with higher levels of education tend to have higher voting participation rates in the United States.

Education increases have also been found to be positively associated with increased earnings. Angrist and Krueger (1991) used quarter of birth as an instrument for education, finding that students required to attend school longer by compulsory school laws earned higher wages because of their extra schooling. Card and Krueger (1992) found that men who are educated in states with higher-quality schools earned higher returns than men educated in states with lower-quality schools. Card (1995) used geographic proximity to a college to estimate the level of education of young men, finding that men who grew up in markets with a nearby college have higher education and earnings than other men. These studies suggest that college enrollment may therefore lead to higher future earnings for individuals. A cursory analysis of U.S. Census data lends support to this hypothesis. For example, the median annual wage in 2010 for an individual with a high school diploma and no college experience was \$35,035. Median income rises to \$40,175 for individuals with some college experience, and to \$55,864 for those with a bachelor's degree.

Job loss and student achievement

Research has shown that parental job loss negatively impacts student achievement. Oster (2005) found that paternal job loss has a negative effect on a child's school performance. Kalil and Ziol-Guest (2007) show that involuntary employment separations for fathers are associated with a higher likelihood of grade repetition and suspension/expulsion from school for their children. They also argued that the adverse effects of paternal job separations operated more through disrupted family dynamics than through income losses in two-parent families. Stevens and Schaller (2005) examined survey data from the U.S. Census to find that parental job loss increased the probability of children's grade retention. Rege et al. (2011) used Norwegian survey data to examine the impact of plant closings on students' GPA, finding a significant, negative impact of paternal job loss. Ananat et al. (2011b) examined the impact of local plant closures. Using county-level data from North Carolina, the authors examined the relationship between county-level job loss and aggregate academic outcomes for children in North Carolina, finding negative effects of community-wide job loss on student test scores. Collectively, these studies provide strong evidence of the negative impact of community-wide job loss on student achievement.

Conversely, evidence suggests that job loss within a community may increase enrollment rates. Raffe (1986) found that students in areas with high unemployment were more likely to remain in school, all else equal. Black et al. (2005) also found that economic downturns reduced dropout rates among high school students. These studies suggest that job loss within a community may lead to an increase in enrollment among students. Furthermore, if students look to school to escape the negative effects of an economic downturn, one might expect enrollment in courses required for college admission to increase, as well.

Business closings as exogenous shocks to workers and communities

However, studies that utilize parental unemployment to estimate the impact of job loss on student outcomes (see, for example, Oster (2005), Levine (2009), Kalil and Ziol-Guest (2007)) are potentially biased because parental unemployment may be endogenous to student outcomes. That is, the same characteristics that lead a parent to become unemployed may also be related to student outcomes. For example, a parent with chronic health problems may be less likely to retain a job and may also be less likely to spend time helping his or her child with schoolwork.

Research suggests, however, that business closings can be viewed as exogenous shocks to communities after controlling for communities' individual characteristics (Jacobson et. al (1993) and Stevens (1997)). Thus, to address the potential endogeneity of unemployment and student outcomes, a growing body of research has utilized job loss resulting from business closures and layoffs to estimate the negative effects of job loss on student achievement (Rege et. al (2011), Stevens and Schaller (2011), Ananat et. al (2011a, 2011b)). These studies estimate the effect on student achievement of job losses, which are plausibly independent of individual characteristics. The reasoning is that job loss from business closings or layoffs results from changes in macroeconomic conditions, and not individual characteristics.

Individual-level effects of job loss

One obvious effect of parental job loss is a reduction in current and (potentially) future parental income. Considerable evidence shows that job loss is followed by large and persistent decreases in income. For example, Oreopoulos et al. (2008) used Canadian administrative data to find that job loss led to large, permanent reductions in family income. Such reductions in income lead to decreased family resources and lower children's achievement (Dahl, 2009).

Job loss may also impact student achievement through increased stress at home among families who were impacted by job loss. Broman et al. (1990) found that parental job loss led to increased family stress. Dew et al. (1987) demonstrated the negative impact of job loss on mental and physical health. Research has shown that parental mental health problems are associated with reduced school achievement among their children (McLoyd, 1998).

Community-level effects of job loss

However, children from families who were not directly impacted by job loss may also be affected by community-wide job loss. Research has found community-level effects of job loss, including increasing levels of racial tension, homelessness, and family instability (Hakim, 1982). Job loss within a community may also lead to increased stress in a classroom or school, or may lower a district's tax base and thereby reduce the resources allocated to a school. Regarding teacher stress, Wiley (2000) found that increased stress among teachers leads to decreased student achievement. Regarding school resources, Ludwig and Bassi (1999) found an association between school resources and student outcomes.

Given the well-established community-level effects of job loss, students whose parents remain employed may also suffer during times of employment reduction. Dooley and Catalano (1984) examined the impact of community job loss on individuals who retain their jobs. They found that increases in job loss within a community were associated with increases in distress among those who remained employed. Increases in stress within schools and classrooms may affect children (for example, through reduced or less effective teacher-student interactions) whose families were not directly impacted by job loss. A reduction in school resources may also impact students whose families were not directly impacted by job loss through, for example,

higher student-teacher ratios or a reduction in available tutors. However, Ananat et al. (2011b) did not find a decrease in school resources resulting from local job loss in North Carolina.

Nevertheless, most studies concerning the impact of job loss on student achievement do not consider the impact of such spillovers. These studies treat the students from families that experienced parental job loss as the treatment group and students from families that avoided job loss as the comparison group. For example, Kalil and DeLeire (2002) examined the impact of parental job loss on students' academic achievement by comparing differences between students whose families experienced job loss and students whose families weren't. Rege et al. (2011) took the same approach to examine the impact of job loss on students' GPAs. Finally, Coelli (2010) also used this approach to measure the impact of parental job loss on students' enrollment at university or community college. If job loss within a community also affects students from families who avoided job loss via community-wide effects, then these studies understate the total impact of job loss on student achievement.

Ananat et al. (2011b) explored the possibility that community job loss also affects students from families who avoided job loss. They found that county job loss decreased aggregate eighth-grade test scores and hypothesized that, in addition to direct effects on children whose parents lost jobs, county job loss indirectly impacted children from families who avoided job loss. The authors also found that the community job loss did not impact schools' level of financing, suggesting that increased stress within the classroom and community may have had a significant impact on students' aggregate test scores. While their study examined the impact on test scores, no study has used this approach to examine the impact of community-wide job loss on students' college readiness, which I define as students taking the necessary courses in their grade that meet the courses required for admission into the University of North Carolina.

Hypotheses

Ample evidence has demonstrated the negative community-level effects of job loss, such as increased stress within a classroom (Wiley (2000)), reduced school resources (Ludwig and Bassi (1999)), and the broad consensus that job loss has negative individual effects on children. Added household stress from parental job loss may also negatively impact a child's motivation and performance at school (Broman (1990)). Therefore, one might expect job loss to be negatively associated with students' college readiness. That is, as job losses in a community increase, the proportion of students being on-track to attend a college or university decrease.

However, the association between parental job loss and college readiness is not entirely clear. As students witness the negative effects of job loss, they may be motivated to remain or excel in school to improve their chances of securing employment in the future. Additionally, parents who lose their jobs may have more time to help their child with their schoolwork or to ensure their child performs well in school. The extent to which community job loss affects students' college readiness depends on which individual effects dominate, as well as the presence and extent of community level effects.

Data and Analytical Method

Data

I rely on data from three sources for this paper. The first is data on job loss within North Carolina from the Business Closings Database, which is an in-house database that contains all business closings and layoffs reported by the North Carolina Employment Security Commission. This database contains information the following data items for all counties in North Carolina and for years 2006 through 2011: the type of business (using the North American Industry

Classification System, NAICS), whether the business is closing or laying off workers, the number of workers affected, the date of employment termination, and the reason for the closing or layoff.

I calculate the level of job loss in each county for each calendar quarter from 2006 to 2011. Job loss resulting from any business closures and layoffs are included. To account for county size skewing the level of job loss within a county, I use a standardized measure of job loss by dividing total job loss by the county's working-age population, which I consider to be those aged 25-64. Summary statistics on the job loss data are presented in Table 1. Observations are at the county level and represent the job loss within a county for each quarter. My data run include all quarters from 2006 until 2011. Thus, I have 2,400 observations of job loss data (100 counties times four quarters per year times six years). The average quarterly job loss for a county is .16 percent. The highest level of quarterly job loss within a county affected 4.9 percent of the working age population. Many counties experienced no job loss from business closings or layoffs during one or more quarters between 2006 and 2011, which is indicated by the min of 0 in Table 1. Figure 1 in the appendix shows the extent of job loss within each county of North Carolina for the 2006 to 2011 time period.

Table 1: Summary Statistics - Quarter Job Loss as Percent of Working Age Population

	Obs.	Mean	Std. Dev.	Min	Max
Job Losses	2400	0.154	0.36	0	5.06

Student achievement data for this paper come from the North Carolina School Administrative Records Database, which is housed at the North Carolina Education Research Data Center at Duke University. This database contains data at the district, school, teacher, and student level. Student level course enrollment and grades are available from 2006 and are

available for all public school districts in North Carolina. The data set also contains student demographics, including gender, race and ethnicity, parents' education level, and free lunch status.

I limit my analysis to 9th graders enrolled in public high schools in North Carolina between the 2006-2007 school year and the 2010-2011 school year. Table 2 provides descriptive statistics of the demographics of students comprising my sample. The sample includes data on all 115 public school LEAs in North Carolina, with a total sample size of 560,037. The sample is roughly half male, half female, with a substantial minority presence. Black students make up the largest minority group, comprising over 29 percent of the sample. Hispanic students are the second largest group, making up nine percent of the sample. Multiple race students, Asian students, and American Indian students collectively make up about 6.5 percent of the sample. Finally, slightly more than 60 percent of my sample includes students who were ever on free or reduced price lunch within a North Carolina public school.

Table 2: Student Demographics	
	Percent of total
Male	51.1
Female	48.9
Race/Ethnicity	
White	55.2
Black	29.3
Hispanic	9.0
Multiple Race	2.7
Asian	2.4
American Indian	1.4
Free Lunch Status (FRL)	
FRL	60.2
Not FRL	39.8
N = 560,037	

Finally, I utilize publically available county-level demographic data from the U.S. Census. Specifically, I use population counts of the working age population (ages 25-64) in the development of my standardized job loss variables.

Dependent Variable

My dependent variable of interest is whether students are on-track to attend college in 9th grade (college ready). To determine which courses a student needs to be enrolled in to be on-track for college enrollment, I referenced the University of North Carolina's minimum course requirements for 4-year college admission, focusing on English, math, and science courses.

I use two measures to represent a student's on-track status. First, I consider whether students take the courses required to gain enrollment into the UNC system. For 9th graders, this includes taking Algebra I or a more advanced math course, English I or a more advance English course, and any science course. A student who is enrolled in on-track English, math, and science courses is considered on-track. Otherwise, the student is considered off-track. For my second outcome variable, I consider whether students take and pass (by earning a D or better) the required courses listed above. A student who is enrolled in and passes on-track English, math, and science courses is considered on-track. Otherwise, the student is considered off-track.

Table 3 summarizes the percentage of on-track students for the entire sample and for subgroups. I focus my subgroup analysis on the black, Hispanic, and white subgroups as these groups make up the vast majority of students in my sample. White students have substantially higher rates of taking on-track courses and passing on-track courses. Black and Hispanic students have similar on-track rates, with roughly 70 percent of black and Hispanic students taking on-

track English, math, and science courses, and roughly 50 percent of black and Hispanic students passing these on-track courses.

Table 3: Percentage on-track for entire sample and racial subgroups

% On-track – taking	
All	78.0
Black	69.7
Hispanic	68.8
White	83.8
% On-track – passing	
All	63.9
Black	49.9
Hispanic	51.3
White	73.1

Independent Variable

My independent variable of interest is the level of job loss in a county. As my unit of analysis is at the student level, I merge job loss with the student data based on the county of the school the student attends. Thus, all students in the same county have the same value of job loss for every quarter in the data set.

Additional Variables

I include several control variables in my analysis, including gender (1 = female), race and ethnicity (non-Hispanic white, non-Hispanic black, and Hispanic) when running my regression on entire sample, and free lunch status (1 if the student has ever been on free lunch, 0 otherwise). In addition to strengthening my regression model by including control variables, possessing

students' demographic information will allow me to run my model for various subgroups (e.g., a particular gender, race, or ethnicity).

Methods

I employ a logistic model to examine the impact of job loss in a given county in a given year on the average probability that students in that county in that year are on-track for college enrollment. I run separate models for my two dependent variables. When examining the impact of job loss on students' taking and passing of on-track courses, my regression model in equation form is:

$$\text{ONTRACK}_{itc} = \beta_1 \text{JOBLOSS}_{ct-1} + \beta_2 \text{JOBLOSS}_{ct-2} + \beta_3 \text{JOBLOSS}_{ct-3} + X_i + y_t + c_c + It_c + \varepsilon_{itc}$$

where β_1 (the primary coefficient of interest) can be interpreted as the impact of job loss on the probability of a student's on-track status, JOBLOSS_{ct-1} , JOBLOSS_{ct-2} , and JOBLOSS_{ct-3} are measures of job loss within a county in times $t-1$, $t-2$, and $t-3$; X_i is the set of student demographics; y_t is an indicator variable for each year; c_c is an indicator variable for each county; It_c is a linear time trend for each county; and ε_{itc} is the error term, which will be clustered at the county level. I cluster at the county level to take into account the fact that the error terms across observations within a county are likely to be correlated.

When examining the impact of job loss on students' taking of on-track courses, my regression model follows the same equation above with exception to the lag used on the job loss variables. For this model, the three job loss variables are lagged by four quarters, five quarters, and six quarters, respectively. These quarters align to the spring and summer months prior to the

beginning of the school year. I include these quarters in my taking model as they are most likely to impact students' course enrollment decisions in the future. Job losses occurring during the school year would not likely impact the courses students choose to enroll in during that school year, as these decisions have already largely been made.

For the taking and passing model, I use one, two, and three quarter lags in the job loss variables. These quarters align to the winter and spring months prior to the end of the school year. I include these quarters in my taking and passing model as they are most likely to impact students' performance on-track courses. Using a greater lag (for example, a four or five month lag) will likely have a smaller effect on students' performance, as the impact of job loss on students would have likely faded over the course of many months.

I include county-fixed effects in my model to control for persistent differences among counties. Similarly, I utilize year fixed effects in my model to account for trends common among all counties over time. Linear trends for each county are included to capture the different over-time trends for each county. Finally, I also incorporated in my regression model the control variables listed above. Employing this model and relying on business closures as exogenous shocks to communities, I can interpret any subsequent effects on student outcomes as being caused by the job loss.

Results

Entire sample estimates

Table 4 presents the results of estimating the impact of job losses on students' college readiness. Coefficients in Table 4 are odds ratios, which can be interpreted as the effect of a one-unit change in the independent variable on the odds of the dependent variable being true. For

example, the interpretation of the job loss coefficient of 1.011 is that a one percent increase in job loss as a percentage of the county's working age population increases the odds that 9th grade students in that county take and pass on-track courses by 1.1 percent, on average.

My results suggest several important points. First, job losses in the first quarter of the calendar year (January through March) prior to the end of the school year significantly and negatively affect student performance in courses that will keep them on-track to attend college. The two-quarter-lagged job loss coefficient of .904 indicates that job losses to one percent of a county's working population during the first calendar quarter reduce the odds of a 9th grade student in that county passing on-track courses by 9.6%, on average. I also find that job losses in the fourth quarter in the prior calendar year (October through December) and the second quarter of the calendar year (April through June) do not significantly affect students' passing of on-track courses. Thus, job loss occurring in the middle of the school year tends to impact student performance, whereas job loss occurring at the beginning or end of the school year does not.

My results also suggest that job losses in the quarter immediately preceding and during the start of the school year (July through September) significantly and positively affect students' enrollment in on-track courses. The four-quarter-lagged job loss coefficient of 1.119 indicates that job losses to one percent of a county's working age population during the third calendar quarter increase the odds that 9th grade students in that county will take on-track courses by 1.19 times. Job loss in the first calendar quarter (January through March) and the second calendar quarter (April through June) prior to the beginning of the school year do not significantly affect students' enrollment in on-track courses. Thus, job loss occurring just prior to the start of the school year tends to impact 9th grade student course enrollment, whereas job loss occurring several months prior to the start of the school year does not.

Subgroup estimates

Table 4 presents the student subgroup estimates. My findings are consistent across subgroups. Job loss in the first quarter of the calendar year significantly and negatively affected the odds that 9th grade students took and passed on-track courses for all groups of students except white students. The effect was particularly strong for females, black students, and Hispanic students. The coefficients for these groups ranged from .844 for black students to .888 for Hispanic students. Similarly, the effect of job loss on taking and passing on-track courses was negative for male students, but to a lesser degree of significance as the impact of job loss on males' course performance appears to be weaker than for other subgroups. Finally, job loss does not significantly impact white students' taking and passing of on-track courses.

Whereas job loss negatively impacted on-track course performance for females, black students, and Hispanic students, job loss in the third calendar quarter significantly and positively impacted on-track course enrollment in the upcoming school year for females, males, and black students. However, Hispanic students were not significantly affected by job loss in the third calendar quarter. White students' course enrollment was also not significantly affected by job losses in the third quarter. Furthermore, similar to the results of the entire sample, job loss in the first and second calendar quarters did not significantly impact students' enrollment in on-track courses for any subgroup.

Table 4: Impact of job loss on college readiness

	Taking and Passing			Taking		
	JLqtr-1	JLqtr-2	JLqtr-3	JLqtr-4	JLqtr-5	JLqtr-6
All students	1.009 (.059)	.906 (.033)***	.966 (.044)	1.119 (.056)**	1.017 (.040)	.972 (.043)
<i>Subgroups</i>						
Gender						
Female	1.000 (.067)	.883 (.031)***	.979 (.053)	1.133 (.065)**	1.047 (.045)	.994 (.049)
Male	1.016 (.057)	.926 (.033)*	.957 (.040)	1.106 (.057)**	.990 (.042)	.958 (.041)
Race/Ethnicity						
Black	1.001 (.059)	.844 (.040)***	.945 (.052)	1.174 (.093)**	1.017 (.056)	.962 (.059)
Hispanic	.923 (.066)	.888 (.056)*	.901 (.068)	1.100 (.114)	1.013 (.052)	.905 (.066)
White	1.028 (.082)	.936 (.040)	.984 (.045)	1.069 (.050)	1.017 (.045)	.996 (.045)
Standard errors in parentheses.						
***p-value<.01						
** p-value<.05						
* p-value<.1						

Robustness check

To examine the robustness of my results, I re-ran my model five additional times, excluding a different year of data for each the runs. This robustness check will determine if my results are being driven by a particular year, which may be the case given the magnitude of job loss experienced during 2008 and 2009.

Results of my robustness check are found in Table 5 in the Appendix. The results are generally consistent with my main findings – job losses in the first calendar quarter have a negative and statistically significant impact on students’ taking and passing of on-track courses. This is true after removing each year of data individually. Similarly, job losses in the third quarter have a positive and statistically significant impact on students’ enrollment in on-track courses after excluding each year individually with the exception of the 2008-09 data. In this

case, job loss lagged four quarters is no longer statistically significant, although it remains positive.

Falsification test

I also conducted a falsification test of my estimation model in which I estimated the impact of future job loss on both of my outcome variables. Significant results from these estimations would suggest that changes to students' enrollment and passing of on-track courses were taking place prior to county job loss, providing evidence against my assumption that job losses are exogenous to county and individual characteristics.

The results of my falsification test are found in Table 6 in the Appendix. The impact of future job loss on both of my outcome variables is insignificant for the entire sample and for all subgroups. This provides further support that job loss within a county increases (decreases) the odds students in that county enroll in (pass) on-track courses.

Discussion

This paper finds that job losses affect 9th grade students' college readiness in both positive and negative ways. Students tend to enroll in courses that put them on-track to attend college during periods of job loss. However, students' chances of passing these courses during periods of job loss are reduced. These findings are particularly strong among female students and black students.

Job loss within a community appears to increase students' motivation, as measured by class enrollment, to prepare themselves for post-secondary education. Job losses to one percent of a county's working age population in the quarter immediately preceding and during the start

of the school year increase the odds that 9th grade students in that county enroll in on-track courses by 11.9%, on average (Table 4, column 5). A potential explanation of this finding is that students may witness the negative effects of job loss in their community, which reinforces the importance and necessity of education as a means toward securing and retaining employment in the future.

On the other hand, job loss within a county decreases the odds that 9th grade students in that county will pass the courses required to enroll in college. Job losses to one percent of a county's working age population in the first calendar quarter reduce the odds that 9th grade students pass on-track courses by 9.4% (Table 4, column 3). While students may be more inclined to enroll in classes to prepare them for college, the data suggest that students might be taking on too much after witnessing job loss, or that stress at the household and/or community level significantly reduces student performance in the courses required for college admission.

Female students and black students appear to be most susceptible to the effects of job loss. County job loss to one percent of the working age population increase the odds that female students enroll in college-ready courses by 13.3%, and decrease the odds that female students pass these courses by 11.7% (Table 4). It may be the case that, for reasons not entirely clear, the increase in motivation to enroll in college and the negative impacts of household and/or community stress following bouts of job loss were particularly strong among female students.

Similarly, following job loss in a community, the odds that black students enroll in college-ready courses increase by 17.4% and the odds that black students pass these courses decrease by 15.6%. This may be the case if the effect of witnessing job loss and the added stress from community job loss is stronger for African-American students than for other subgroups.

This result may also follow if parents of African-American students were more likely to be employed in the industries that experienced job loss during this timeframe.

In contrast, white students' enrollment and performance in on-track courses do not seem to be impacted by county job loss. This result follows if parents of white students were less likely to be impacted by community job loss during this timeframe and that community effects were not sufficiently strong to significantly impact white students' course enrollment and performance. It may also be that white students had additional resources not afforded to other subgroups that helped mitigate some of the negative effects of community job loss.

My primary findings – that job loss increases student enrollment in courses required for college enrollment and decreases student performance in those courses – follow my hypotheses and are consistent with past research regarding the effects of job loss on student achievement. Raffe (1986) and Black et al. (2005) found that high unemployment and economic downturns reduced dropout rates. Similarly, Oster (2005), Khalil and Ziol-Guest (2007), Rege et al. (2011), and Ananat et al. (2011a, 2011b) have shown that parental job loss negatively impacts student performance.

Limitations to this study should be noted. First, my results apply only to 9th grade students in public schools in North Carolina. Community job losses in other states, which may follow different economic, education, and social policies, might affect students in those states differently. Furthermore, students in charter schools, magnet schools, and private schools (in, and outside of, North Carolina) might also respond differently to job loss within a community. My results, therefore, do not predict how these students would be affected by future bouts of job loss.

A second limitation of my study is that I do not observe students who are directly impacted by job loss. This is the case since my data are aggregated at the county level. As a result, I am unable to parse out the direct effect of parental job loss (i.e., the effect on a student whose parent(s) lost jobs) from any community-level effects (e.g., increased stress in the classroom, a reduction in school resources). Furthermore, because I am unable to measure community-level effects, I am unable to determine which of the community-level effects, if any, are driving my results. However, past research suggests that such “spillovers” are likely present (Ananat et al. (2011a, 2011b).

Nevertheless, this study demonstrates that state and local policymakers as well as school officials should be aware of the influence local economic events and crises have on students’ enrollment and performance in courses that prepare them for college. Policymakers may want to take into account recent economic trends when allocating district and school budgets, and school officials may want to increase school resources devoted to courses required for college admission during periods of local job loss.

Sources

- Ananat, E.O., Gassman-Pines, A., Francis, D. & Gibson-Davis, C.M. (2011a). Children Left Behind: The Effects of Statewide Job Loss on Student Achievement. *NBER Working Paper, No. 17104*.
- Ananat, E., Gassman-Pines, A., and Gibson-Davis, C.M, (2011b) *The Effect of Plant Closings on Children's Educational Achievement*, in *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances*, edited by G. J. Duncan, R. Murnane (2011), pp. 299-313
- Black, D. A., McKinnish, T. G., & Sanders, S. S. (2005). The Economic Impact of the Coal Boom and Bust. *The Economic Journal, 115*, 449-476.
- Breierova, L. & Duflo, E., 2004. "The Impact of Education on Fertility and Child Mortality: Do Fathers Really Matter Less Than Mothers?" *NBER Working Paper No. 10513*.
- Broman, C., Hamilton, V.L., Hoffman, W. (1990). Unemployment and Its Effects on Families: Evidence from a Plant Closing Study. *American Journal of Community Psychology, 18*, 643-659.
- Card, D. (1999) "The Causal Effect of Schooling on Earnings." *Handbook of Labor Economics*.
- Card, D. & Krueger, A. (1992). "Does School Quality Matter? Returns to Education and the Characteristics of Public School in the United States." *Journal of Political Economy, 100(1)*, 1-40.
- Coelli, M. B. (2010). Parental job loss and the education enrollment of youth. *Labour Economics, 18*, 25-35.

- Conley, D. T., Aspengren, K., Stout, O., & Veach, D. (2006c). College Board Advanced Placement best practices course study report. Eugene, OR: Educational Policy Improvement Center.
- Dahl, G., & Lochner, L. (2009). The impact of family income on child achievement: Evidence from the Earned Income Tax Credit. *NBER Working Paper No. 14599*.
- Dew, M.A., Bromet, E., & Schulberg, H. (1987). A Comparative Analysis of Two Community Stressors' Long-Term Mental Health Effects. *American Journal of Community Psychology, 15*, 167-184.
- Dooley, D., & Catalano, R. (1984). The epidemiology of economic stress. *American Journal of Community Psychology, 12*, 387-409.
- Hakim, C. (1982). The Social Consequences of High Unemployment. *Journal of Social Policy, 11*, 433-467.
- Hamre, B. K., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625-638.
- Hauser, R.M. (1993). Trends in College Entry among Whites, Blacks, and Hispanics. *Studies of Supply and Demand in Higher Education*, Charles T. Clotfelter and Michael Rothschild, eds. Chicago: University of Chicago Press.
- Jacobson, L.S., LaLonde, R.S., & Sullivan, D.G. (1993). Earnings losses of displaced workers. *American Economic Review, 83*, 685-709.
- Kalil, A., & DeLeire, T. (2002). Parental job loss and early adolescent development in Black and White families. *JCPR Working Paper 282*.
- Kalil, A., & Ziol-Guest, K. (2008). Parental employment circumstances and children's academic progress. *Social Science Research, 37*, 500-515.

- Kenny, L., Lee, L., Maddala, G., & Trost, R. (1979). Returns to College Education: An Investigation of Self-Selection Bias Based on the Project Talent Data. *International Economic Review*, Vol. 20, No. 3, 775-789.
- Ludwig, Jens & Laurie Bassi (1999). "The Puzzling Case of School Resources and Student Achievement." *Educational Evaluation and Policy Analysis* 21: 385-403.
- Manski, C.F. & Wise, D. (1983). *College Choice in America*. Cambridge, Mass: Harvard University Press.
- McLoyd, V.C. (1998). "Socioeconomic disadvantage and child development." *American Psychologist*, 53, 185-204.
- Morris, P. A., & Gennetian, L. A. (2003). Identifying the effects of income on children's development using experimental data. *Journal of Marriage and Family*, 65, 716-729.
- National Center for Education Statistics. (2011). Table 210. Recent high school completers and their enrollment in 2-year and 4-year colleges: 1960 through 2010. <<http://nces.ed.gov>>
- Oreopoulos, P., Page, M. E., & Stevens, A. H. (2008). The intergenerational effects of worker displacement. *Journal of Labor Economics*, 24, 729-760.
- Oster, A. (2005). Parental unemployment and children's school performance. *Institute for Labor Market Policy Evaluation*.
- Psacharopoulos, G. (1985). Returns to Education: A Further International Update and Implications. *Journal of Human Resources*, 20, 583-604.
- Raffe, D. & Willms, D. (1986). Schooling the Discouraged Worker: Local-Labour-Market Effects on Education Displacement. *Sociology*, 23, 559-581.
- Rege, M., Telle, K., & Votruba, M. (2011). Parental Job Loss and Children's School Performance. *The Review of Economic Studies*.

Rogers, R., Hummer, R., & Everett, B. (2012). Educational differentials in US adult mortality:

An examination of mediating factors. *Social Science Research*.

Stevens, A. H., & Schaller, J. (2011). Short-run effects of parental job loss on children's

academic achievement. *Economics of Education Review*, 30, 289-299.

U.S. Census Bureau. (2010). Annual Social and Economic Supplement. Retrieved from

http://www.census.gov/hhes/www/cpstables/032011/perinc/new03_028.htm

Appendix

Figure 1

County Job Loss as a Percentage of Working Age Population, North Carolina (2006-2011)

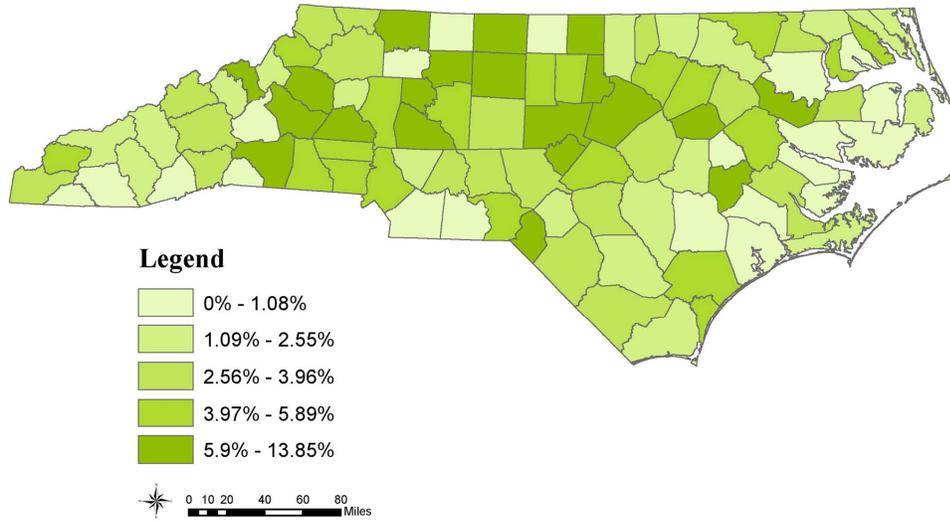


Table 5: Robustness check – 2006-07 through 2010-11 with omitted years

	2006-07	2007-08	Omitted Year		
			2008-09	2009-10	2010-11
Taking and Passing					
JLqtr-1	.979 (.057)	1.016 (.088)	1.062 (.083)	.976 (.052)	.990 (.065)
JLqtr-2	.912 (.044)*	.927 (.041)*	.872 (.059)**	.908 (.032)***	.903 (.036)**
JLqtr-3	.985 (.045)	.972 (.054)	.934 (.082)	.971 (.044)	.968 (.041)
Taking					
JLqtr-4	1.177 (.080)**	1.207 (.114)**	1.079 (.065)	1.093 (.048)**	1.093 (.057)*
JLqtr-5	1.027 (.052)	1.040 (.039)	.962 (.073)	1.029 (.041)	1.020 (.061)
JLqtr-6	1.026 (.046)	.961 (.052)	.945 (.048)	.935 (.074)	1.017 (.049)

Table 6: Falsification test - Impact of future job loss on college readiness

	Taking & Passing	Taking
All students	.979 (.055)	.927 (.074)
<i>Subgroups</i>		
Gender		
Female	1.009 (.067)	.937 (.089)
Male	.957 (.053)	.921 (.069)
Race/Ethnicity		
Black	1.008 (.107)	.892 (.155)
Hispanic	.919 (.074)	.835 (.102)
White	.982 (.055)	.968 (.055)