Down and Enrolled:

An Examination of the Enrollment Response to Cyclical Trends and Job Loss

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Abstract

Cyclical contractions in labor market opportunities may lead to increased demand for post-secondary education as the opportunity cost of enrollment falls during bad economic times. However, decisions to enroll also depend on the capacity to finance college and it is likely that credit constraints will be exacerbated in bad economic times and among workers who have experienced job loss. As a starting point, we measure the enrollment response to changing economic conditions, comparing eighteen and nineteen year-olds and older individuals likely to have accumulated some labor market experience. We find that individuals in their mid to late-twenties are proportionally more responsive to cyclical variation. Our work identifies a substantial role of the Unemployment Insurance (UI) program in determining post-secondary enrollment outcomes. States in which academic post-secondary programs unrelated to a specific occupation are allowable under UI have substantially magnified enrollment responses to local economic conditions. In addition, we provide some of the first evidence that the duration of UI affects a displaced individual's propensity to enroll; when the duration of UI is extended by ten weeks, enrollment of job losers increases by 2 percentage points (over 20%). These findings identify a substantial overlap between UI policy and post-secondary enrollment decisions, indicating the potential importance of UI in not only providing income but also facilitating investments in skills.

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1 Introduction

The spike in unemployment with the Great Recession to a nearly three decade high also brought an increase in post-secondary participation. To illustrate, college enrollment increased from 18.2 million students to 20.4 million students between 2007 and 2009.[1] While much of the research literature has focused on the enrollment response of recent high school graduates to changes in local economic conditions (Clark, 2011), many of the new participants in postsecondary education in recent years are somewhat older students, including a number of individuals who have been displaced from the labor market. As a point of reference, college enrollment increased by 7.2% among those 18-23, by 12.6% among those 24-29 and by nearly 25% among the unemployed between 2007 and 2009 (authors' calculations from the October CPS).

While many canonical models of educational investment posit school leaving as a once and for all decision (Becker, 1967; Mincer, 1974; Ben-Porath, 1967), the empirical evidence demonstrates that a substantial number of young adults have interrupted schooling trajectories. Indeed, the incidence of decisions to return to college may increase during cyclical downturns, plausibly because the opportunity costs of investment decrease and shifts in labor market demand may provide substantial returns to "retooling."

Whether individuals no longer receiving support from their parents are able to invest in post-secondary education depends on their capacity to finance college. On one hand, cyclical downturns may be associated with negative income shocks and tightening credit markets which would make it difficult to finance education. On the other hand, access to federal financial aid and income stabilization afforded by the Unemployment Insurance (UI) program may provide opportunities to finance higher education. During the Great Recession, both forces were clearly at play. While credit markets tightened appreciably and there were substantial income shocks, it is also the case that the generosity of federal Pell grants increased while unemployment benefits were extended well-beyond the standard 26

[1] Digest of Education Statistics (2012), Table 198, http://nces.ed.gov/programs/digest/d12/tables/dt12$_1$98.*asp*.

weeks. Thus, the enrollment response to changing labor market conditions during the period of the the Great Recession is an empirical question.

The extent to which unemployed workers are able to avail themselves of post-secondary educational opportunities is a topic that has not received much attention in economic analyses of student aid or in evaluations of social insurance programs. While there is a full literature in economics studying the effects of UI on the duration of unemployment (see, for example, Meyer, 1995 and Chetty, 2008), the literature on how UI program parameters impact post-secondary enrollment is notably sparse. In 2010, more than 13% of the unemployed age 20-30 were enrolled in college; post-secondary participation in response to job loss may be yet larger if some workers shift from job search to enrollment, exiting the labor force. In addition, other workers may enter post-secondary training programs in response to underemployment or as a pathway to labor force reentry.

As many displaced workers meet the means tests required for federal financial aid eligibility (including Pell grants and subsidized Stafford loans), we consider the extent to which federal financial aid policies may complement UI and encourage displaced workers to invest in post-secondary enrollment. Given the state-specific program parameters of UI, displaced workers differ markedly in the extent to which higher education programs are "allowed" under state UI regulations. Large increases in benefit duration, like those during the Great Recession, may also affect enrollment as they drive down the opportunity cost of enrollment and potentially ease credit constraints. Using this variation, we find that longer benefit durations tend to be associated with a greater propensity for enrollment.

The substantial enrollment response among the unemployed and job losers suggests an important interaction between postsecondary policies and public programs targeted to the unemployed. Very little research has examined how UI program parameters and labor market conditions affect enrollment decisions. In addition, other active labor market programs such as the Workforce Investment Act (WIA) training may also affect post-secondary participation, though these programs are actually much smaller in scale

than programs like Pell.

We begin by examining the overall cyclicality of enrollment demand, with a particular emphasis on responses during the period of the Great Recession. In the third section, we consider the policy initiatives that may mediate the effect of cyclical downturns on enrollment, specifically considering Pell grant generosity, terms of UI, and state-level variation in the support for public higher education. In the fourth section, we describe the data we use which includes individual level microdata from the October CPS and administrative data on Pell grant utilization. In section five, we outline our empirical strategy. The sixth section presents results and the final section concludes.

2 Cyclicality of Enrollment Demand

2.1 Empirical Motivation

To motivate the analysis, Figure 1 presents the trend in the aggregate enrollment rate for the population ages 18-40 and the unemployment rate over time, with the bottom panel showing the detrended enrollment series.[2] The vertical lines in the figure show the periods of recession, as defined by the NBER. While there is a secular trend in enrollments, it is also clear that – conditional on a parametric trend – enrollment tends to move in the same direction as the unemployment rate. As illustrated in the figure, this relationship appears to grow stronger over time (the correlation between detrended enrollment and the unemployment rate is .56 over the period from 1978-2011, nearly .8 for 1990-2011, and over .9 for 2004-2011).

In Figures 2-4, we distinguish variation in enrollment rates by student age. Over the same periods, the unemployment-enrollment relationship is weaker for 18-19 year olds (r=.17, .45, and .29 respectively) and 20-24 year olds (r=-.12, .12, and .29) than 25-30 year olds (r=.59, .72, .93).[3] Descriptively, this correlation is consistently stronger for the

[2] All detrended series are detrended using a linear trend. Figures are quite similar using a quadratic and cubic trend.

[3] Regressing the detrended series on the national unemployment rate for the 25-30 year olds for 2004-2010 yields

relatively older groups and tends to strengthen over time for all age groups.

Using micro data from the Census and CPS files, prior empirical analyses of the educational investments of youth show a large effect of the unemployment rate on high school graduation, a modest effect on college enrollment, and no effect on college degree attainment (Kane, 1994; Card and Lemieux, 2001). These analyses typically take advantage of within-state variation over time in the unemployment rate, as well as other measures such as state tuition and cohort size.[4] For these papers, the primary focus is on the economic conditions facing youth at the end of high school or typical college-going ages.

Yet, those most likely to seek postsecondary training in response to cyclical shocks may be outside the set defined as traditional college students. Thus, it is not surprising that analyses that include somewhat older students find a larger countercyclical link with college enrollment. Furthermore, college enrollment of older students has increased in quantitative significance over the last four decades. While during the early 1970s the vast majority of students enrolled in college as undergraduates were between the ages of 18 and 23 (in 1970, 74% of enrolled students were between the ages of 18 and 21), recent data show that only about 54% of undergraduate students are of traditional college age.[5] To this end, focusing on recent high school graduates may miss part of the enrollment response to cyclical shocks. Indeed, as shown in the bottom panel of Figure 4, there is clear cyclical variation in the enrollment of older individuals (between 25 and 30).

2.2 Theoretical Framework

Presentations of the demand for education often note that transitory changes in economic conditions such as changes in the unemployment rate or the expected level of

a coefficient of .0027, quite similar to the results we finding using state variation in unemployment rates in Section 6 of this paper.

[4]Using data from the UK, Clark (2009) finds that with measures of the youth labor market as the key explanatory variables, local labor market conditions have a substantial impact on the post-compulsory enrollment decisions of girls and boys.

[5]Source: U.S. Census Bureau, Current Population Survey. Table A-7. College Enrollment of Students 14 Years Old and Over, by Type of College, Attendance Status, Age, and Gender: October 1970 to 2010, http://www.census.gov/hhes/school/data/cps/historical/index.html.

earnings affect the collegiate investment decision by changing the opportunity cost of time spent in college. During periods of high unemployment or recession, the opportunity cost of time is lower and thus individuals are likely to consider persisting in school. For those already in the labor force, skill acquisition may continue through on-the-job training, apprenticeships, and other training programs.[6] Because cyclical downturns reduce the opportunity cost of time, it is expected that workers shift training investments to relatively slack labor market periods. In addition, shocks to labor demand may be tied to technological changes that make some skills obsolete (or open new opportunities in emerging industries). Moreover, to the extent that the real wage is procyclical (Solon, Barsky and Parker 1994), recessionary conditions would be expected to put upward pressure on enrollment demand.

Yet, such predicted adjustments in enrollment may be limited if potential students are credit constrained. For recent high school graduates, we would expect declining parental resources combined with limited in–school employment prospects to curtail a student's capacity to finance post-secondary education.[7] For older individuals who are not dependent on their parents for financial support, diminished employment prospects and declining value of assets like housing may similarly adversely impact the capacity to finance college.

Moreover, as we discuss in greater detail in the next section, declining public support for colleges and universities may lead to a supply-side contraction during a cyclical downturn. Thus, given two opposing theoretical predictions, the cyclicality of enrollment demand is widely viewed as an empirical question. In considering the expected magnitude of the enrollment response, we predict considerable heterogeneity in responses by age and individual characteristics. For recent high school graduates, the effects of a cyclical downturn may not have a substantial impact on long-term returns to college investments, though short-term credit constraints may limit college choice or the capacity to enroll.

[6] In one of the few studies focusing on the effects of local economic conditions on education choices outside of high school and college, Lynch (1992) finds that on-the-job vocational training increases while on-the-job training declines when the local unemployment rate is high.

[7] Lovenheim (2011) shows that, particularly for relatively low-income families, changes in housing wealth have a substantial effect on enrollment.

3 Postsecondary and Labor Market Policies Affecting Enrollment

Whether potential students have the capacity to finance college tuition and associated living expenses during a recession is an important determinant of the observed cyclicality of college enrollment. Given that many potential students are likely to have little accrued savings, the generosity and eligibility requirements of financial aid and labor market policies are likely to have a substantial impact on enrollment decisions. In this section, we describe these basic policies and the variation in these policies over time and across states.

3.1 Federal Financial Aid – Pell Grants and Student Loans

The foundational federal student aid programs including Pell grants and Stafford loans provide an important source of capital to fund post-secondary enrollment. Pell grants are explicitly means-tested: students (and parents of dependent students) must complete the FAFSA form; in 2010-11, about 85% of Pell grant recipients reported family income less than $40,000 (USDOE 2011). The legislation crafting the Pell grant program provided explicit openings for "independent students", placing older students on the same footing as recent high school graduates in the competition for federal aid. The introduction of the Pell program had a substantial effect on the postsecondary enrollment of students outside of the traditional college-going ages (Seftor and Turner, 2002).[8] In 2010-11, 59% of Pell grant recipients were independent students, up from 41% in 1980-81 (USDOE 1981, 2011). In recessionary periods prior to 2000, increases in the unemployment rate correlated with decreases in the real value of the Pell Grant. In sharp contrast, program generosity has increased during the two most recent cyclical downturns (Figure 5).

In addition to potential funding from the Pell grant program, all college students have some access to capital to finance college through the Stafford Loan program. These

[8] Eligibility for students claiming independent status has become more restrictive since the inception of the program. The 1986 amendments to the Higher Education Act required students to be at least 24 years old, married, or with children to qualify for aid as an independent student.

subsidized Stafford loans rose from about $15 billion in 1990 to $20 billion in 2000, before jumping to $35 billion in 2009 (all in constant 2009 dollars). Students may also receive private loan funding for post-secondary study. This market increased dramatically, beginning in the late 1990s, and then contracted markedly after the credit crisis in 2008. Private sector loans were about $1.5 billion (constant 2009 dollars) in 1995-1996, they grew to $17.6 billion by 2007-2008, representing about 20 percent of all loan funds distributed (College Board, 2008). Overall, in 2009, subsidized Stafford loans accounted for about 43 percent of federal loan volume, with unsubsidized Stafford loans accounting for 40 percent and PLUS loans for 16 percent. However, it is important to remember that federal lending for higher education is not a complete measure of total lending for that purpose. For example, the growth in federal student loans may overstate the true increase in borrowing for students to attend college, if the increase in Stafford loans supplanted other types of loans – like home equity loans – in some cases used previously to pay for college costs.

Overall, during the years immediately prior to and at the beginning of the Great Recession in 2008 (unlike cyclical downturns in the 1980s and early-1990s), federal student aid became more generous. For this reason, we would expect the enrollment response to the downturn to be magnified as the generosity of need based aid increased, though other factors such as rising college costs and falling incomes may push in the opposite direction.

3.2 State Support for Higher Education

States support college enrollment through two primary sources: direct support of colleges and universities and grant aid to students, where the former is far larger than the latter. Notably, because states – unlike the federal government – have balanced budget constraints – state support for higher education tends to contract during cyclical downturns, adversely affecting both appropriations and grant aid.

Changes in state appropriations impact the supply side of higher education. Enrollment opportunities may increase less than proportionately with increases in demand,

particularly at public institutions when state appropriations decline (Bound and Turner, 2003). While community colleges may be thought of as providing an "automatic stabilizer" to the local economy (Betts and McFarland, 1995), the capacity to perform this function may be limited by the cyclical nature of state funding.[9] We illustrate this relationship in Figure 6, where average detrended appropriations move inversely to the unemployment rate. When we examine the empirical link between appropriations and the unemployment rate using variation within states over time, we find that a one point increase in the unemployment rate leads to a 3% reduction in appropriations per student over the time period from 1978-2010.[10] This relationship has grown stronger over time, with a four percent reduction in appropriations per student in response to a point increase in the unemployment rate over the last decade, plausibly because the growth of entitlements like Medicaid leave fewer other discretionary expenditures for state legislators to cut in economic downturns.

What is more, with shrinking state appropriations to public institutions, many college and universities try to recover at least some of this lost revenue with increased tuition charges. Overall, a 1 percentage point increase in the unemployment rate is associated with a 1.3% increase tuition levels at community colleges and a 2.3% increase in tuition levels at public 4-year universities. Thus, while the Great Recession has brought large increases in federal financial aid, it also drove increases in tuition levels which have made it more difficult for students to afford investing in further training.

3.3 Unemployment Insurance and Active Labor Market Programs

While it is common to focus on student aid policies as a primary determinant of college enrollment, labor market policies – including UI and active labor market initiatives

[9] As evidence of the severity of crowding in economic hard times, Betts and McFarland (1995) note that during the 1991 recession about 45,000 students in California community colleges withdrew because they were unable to obtain desired courses.

[10] All specifications include year and state fixed effects. Observations are the log of the real appropriations per public school student ($2010) and the log of real tuition ($2010) at the state-year level. [Full results available from the authors on request.]

like the WIA – play a pivotal role in determining how and whether displaced workers engage in postsecondary training. There is growing evidence that displaced workers benefit from high quality training, with high-quality collegiate-level programs often having the largest impact on future earnings (Jacobson, Lalonde and Sullivan, 2011). Because UI program parameters are determined mainly at the state level, different states not only have different benefit levels (determining replacement ratios and other work incentives) but they also employ varying criteria for the determination of eligible training, which would allow a beneficiary to enroll in college or job skills training while also receiving benefits. While virtually any undergraduate program would qualify in some states (e.g., Delaware or California), other states limit qualified training to a much narrower set of explicitly vocational programs (e.g., Alabama or South Carolina). Appendix Table A2 illustrates this variation in more detail, indicating which states approve academic courses not leading to a specific occupation and which approve some 4-year post-secondary programs. One policy concern surfacing early in 2009 was that many unemployed workers did not know of their eligibility for Pell grants and other financial aid to finance training while unemployed. In May of 2009, the U.S. Departments of Education and Labor joined together to promote Pell grants for the unemployed as well as changing state policies regarding simultaneous receipt of federal financial aid and UI benefits. In addition to promotion at the national level through Opportunity.gov, states were encouraged to send letters to those receiving UI benefits, increasing awareness of the program. Roughly forty states had sent or were in the process of sending these letters by the end of 2009 (NASWA 2010).[11]

Beyond variation across states in qualifying training and Pell awareness, the expected length of UI coverage likely impacts decisions to pursue post-secondary training. With extended UI duration, an individual can plan a training investment with reduced concerns about credit constraints impeding his or her capacity to finish the program. While one

[11]Most states that chose not to send letters felt the policy contradicted their approved training laws and thus would be misleading. We attempted to explore the effect of these letters empirically, but ultimately determined that this was a weak test given data limitations and heterogeneity in the method of program notification across states. States sent letters to different groups of individuals, some states included the information on their websites instead, etc.; thus, specification of the policy change proved difficult.

would generally be concerned that the extension of benefits is correlated with other local economic conditions, there is also a substantial "haphazard" component to the roll-out of extended benefits (Rothstein 2011). Laws predating the Great Recession generally provided 26 weeks of benefits with an additional 20 weeks of "Extended Benefits" (EB) in high unemployment circumstances; beginning in June 2008, a relatively ad hoc set of Congressional authorizations eventually raised statutory maximum benefit durations as high as 99 weeks for displaced workers in some states (Rothstein, 2011). The Emergency Unemployment Compensation (EUC), which provided these additional benefits at the federal level, added a series of benefit"tiers" in November 2008 and November 2009. These "tiers", triggered by a state's unemployment rate rising above certain levels, resulted in additional weeks of benefits.[12] In addition, the American Recovery and Reinvestment Act of 2009 provided funding for EB. This led to a number of states altering their participation and trigger decisions for EB. Combining EUC (up to 53 weeks) and EB (up to 20 weeks) with regular benefits (usually 26 weeks), statutory benefit durations were extended to as long as 99 weeks in number of states.[13]

During the period of the Great Recession, Congress expanded the funds available through the Workforce Investment Act (WIA) program, essentially doubling the level of federal support through the ARRA. While a portion of WIA funds are allocated to training, the traditional focus of the program was to get individuals back to work, placing more emphasis on job search assistance. Even as a somewhat increased emphasis has been placed on training in recent years, a relatively small share of WIA recipients receive training. In 2010, only 290,098 of 1,985,222 (14.6%) adult or dislocated WIA recipients received training and nearly 50% of those who received training completed a License, Credential, or Certificate. As only 3.1% of adult or disclocated WIA training participants (and .4% of all WIA adult or disclocated enrollees) received a Pell grant, we infer that participation in

[12]See Table1 of Rothstein (2011) which demonstrates how the number of tiers and weeks available evolved over time.

[13]The actual weeks of benefits expected by an individual was always lower than this as EUC program expiration (which was sometimes only a few months away) allowed an individual to finish a tier of benefits, but no more. See Rothstein (2011) for more information.

degree credit enrollment is quite modest.[14] Evaluating a WIA effect on enrollment is made difficult by the degree of program determination and differentiation that occurs at the local level and a lack of data, both of which hinder quantification and evaluation of the effects of variation in program features (Card et al, 2010 and Heinrich et al, 2009). Because so few WIA recipients are in degree credit programs, we expect the true effect of WIA on college enrollment is very modest. However, because a substantial share of WIA training activities are conducted at community colleges, it is possible that some participants may respond to CPS enumerators as "enrolled in college."[15] Even as we focus on degree-granting enrollment, our estimates may include the effects of changing WIA parameters to some degree due to misclassification of vocational and other short-term enrollment.

4 Data

To investigate the recent cyclicality of enrollment we use data from the October Education Supplement to the Current Population Survey (CPS). We combine these data with information collected on state variation in approved training as well as UI benefit duration data. Finally, we present some supplementary analyses using aggregate Pell recipient data by institution obtained from the Federal Student Aid Office of the US Department of Education.

We use the October Education Supplement to the CPS as it is the only large scale micro-level dataset to pose enrollment questions to a broad range of ages on an annual basis over the time frame of our study.[16] This allows for an examination of the recent cyclical downturn and the ensuing policy responses on older non-traditional individuals.

[14] Authors calculations using information contained in PY 2010 WIA Summary Report for Adults and the PY 2010 WIA Summary Report for Dislocated Workers available at:
http://www.doleta.gov/performance/results/Pdf/py10_adult_summary_rpt.pdf and,
http://www.doleta.gov/performance/results/Pdf/py10_dw_summary_rpt.pdf.

[15] The October CPS variable asks about degree granting enrollment, but it is unclear to what degree individuals enrolled in short-term vocational classes and certificate programs at community or for-profit colleges may misunderstand the question.

[16] The ACS did not survey individuals living in group quarters (e.g., dorms) until 2006. Furthermore, we are unable to determine when in the year an individual is enrolled without access to restricted data. In other CPS months, the enrollment question is limited to those 24 and younger.

One limitation of the CPS data is that it is not feasible to measure persistence in enrollment or post-enrollment outcomes. Because the CPS limits questions about college enrollment to those ages 24 and younger outside the month of October, we are unable to use the rotation structure to track persistence or month-to-month enrollment. Similarly, with only October to October repeated observations per individual, we are limited in our capacity to observe long-term outcomes such as employment or wages.[17]

The October CPS also contains basic labor force information including employment status, the reason an individual is unemployed, and unemployment durations. However, as noted by Rothstein (2011), the CPS does not indicate whether an individual is actually eligible for or receiving unemployment benefits. We proxy for eligibility using the self-reported reason for unemployment, classifying job losers and individuals on layoff as UI eligible, while job leavers, entrants, and re-entrants are considered non-eligible.[18] We present basic statistics for unemployed individuals in Table 2, separating the sample by enrollment status. Overall, unemployed enrolled individuals are younger (23.1 vs 27.8), more likely to be female, and less likely to be a minority. They also have generally been unemployed for fewer weeks (19.9 vs 23.6). Among the population of job losers, the disparity in age (26.3 and 29.7) and unemployment duration (23.5 vs 23.2) is much smaller suggesting that much of the difference in mean age and unemployment duration between enrolled and non-enrolled individuals is driven by young "new entrants" and "re-entrants".

The nature of the employment status and unemployment duration variables leads to misclassification concerns. As these data are self-reported, and the variable definitions not transparent to respondents, there is likely some degree of misclassification, introducing measurement error.[19] We view this issue as relatively minor because we are primarily interested in the effects of benefit duration on the enrollment decision rather than changes

[17] Linking young adult individuals across years results in poor match rates, making it an infeasible approach.

[18] As discussed later, and in Rothstein (2011), there is likely mis-classification here resulting in some individuals classified as non-UI eligible being eligible and vice-versa. Furthermore, our classification will likely overstate eligibility on average as we are unable to condition on employment and earnings eligibility criteria. This should bias our estimates of the effect of changing benefit durations towards zero.

[19] Furthermore, as noted by Rothstein (2011) there is substantial heaping in the distribution of unemployment durations, suggesting rounding.

in employment status over time. However, mis-classification makes it more likely that we will observe a response to longer UI benefit durations among job leavers.

We match the main data sources with information on state-approved UI training policies derived from the National Association of State Workforce Agencies, state websites, and correspondence with state employment commissions (NASWA 2010). Appendix Table A2 summarizes the variation in state policies with some states approving a wide variety of post-secondary enrollment and others prohibiting most or all enrollment at academic institutions. As illustrated in Figure 8, approval of academic courses not related to a particular occupation varies both across and within regions of the country. States which allow academic courses not leading to a specific occupation include traditionally liberal California and Massachusetts alongside conservative Texas, Georgia, and North Carolina. Similarly, unreceptive states include liberal Pennsylvania, Maryland, New Jersey, and Washington as well as conservative-leaning Virginia, Louisiana, Arizona, Mississippi, and Nebraska.

We also match individuals in the October CPS to two measures of benefit durations provided to UI eligible individuals: (1) the number of weeks of benefits available to them upon becoming unemployed, and (2) the number of weeks available during August of the year in which they are interviewed. We derive the number of weeks of benefits available from detailed information on Extended Unemployment Compensation (EUC) and Extended Benefit (EB) benefits at a state-week level (see Rothstein 2011 for further discussion of this process). As illustrated in Figure 9, the EUC and EB triggers resulted in meaningful levels of variation across and within states over time.

5 Estimation Strategy

Our analysis begins with the measurement of the college enrollment response to cyclical variation in the labor market conditions at the state level. State variation in the unemployment rate reflects the observation that cyclical contractions have, historically,

varied markedly across states. Significantly, states are also the important unit of policy variation in parameters of the UI program and tuition setting at public colleges and universities. We examine how the enrollment response differs with the rules regarding UI receipt and collegiate enrollment as well as the duration of UI benefits. We are interested in how variation in state and federal policies, which effectively shifts the cost of enrollment, attenuates or intensifies the enrollment effect of labor market contractions for unemployed individuals.

5.1 Overall Enrollment and the Labor Market

Our initial empirical work addresses the overall college enrollment sensitivity to changes in local economic conditions, as measured by the state unemployment rate. Our basic specification considers:

$$E_{ist} = \beta_1 X_{ist} + \alpha_s + \lambda_t + \beta_2 UR_{st} + \epsilon_{ist} \tag{1}$$

We ask how increases in the unemployment rate impact enrollment at time t in state s, conditioning on time effects, state fixed effects, and individual covariates. We estimate this basic specification with individual level data from the CPS. We also use the log of state-level measures of Pell grant receipt as the dependent variable; these measures capture both changes in enrollment among low income students and variation in the level of financial need among those who do enroll. We also consider the extent to which cyclical effects on enrollment vary by age and (similarly) dependency status.

5.2 Approved Training Policies and the Unemployment-Enrollment Link

We combine the basic specification above with cross-state variation in pre-existing UI training policies in an effort to more closely examine the enrollment impact for the population of displaced workers. Following our conceptual model, we expect variation that

reduces the cost of schooling for unemployed individuals to magnify the unemployment-enrollment link. As unemployment rose dramatically during the Great Recession, one would expect to find a stronger relationship between unemployment and enrollment in states that are more receptive of academic training for the unemployed. We examine this interaction using state approval of "academic courses not leading to a specific occupation". In order to test this prediction, we specify the following linear probability model of enrollment:

$$E_{ist} = \beta_1 X_{ist} + \alpha_s + \lambda_t + \beta_2 UR_{st} + \beta_3 UR_{st} * A_s + \epsilon_{ist} \tag{2}$$

The coefficient of interest β_3 indicates the degree to which higher unemployment rates result in different enrollment responses in states with UI training policies that are more supportive of academic training ($A_s = 1$).[20] We employ a similar approach using state-by-year Pell grant data.

Functionally, this is akin to a difference-in-differences (DD) approach. State fixed effects control for pre-existing differences in enrollment patterns. We then compare how changes in unemployment rates affect enrollment propensities in states receptive to academic training with those that are not. As in the standard DD approach, if there are other unobserved factors affecting receptive states differently than unreceptive states (at the same time as the unemployment rate rises), we will attribute the corresponding difference in the cyclical trends of the two groups of states incorrectly to the pre-existing UI policies.[21]

[20] As indicated in Table A2, there is a small degree of variation in A_s over time. However, we are unable to estimate effects off of this variation as only two states indicated changes in receptivity to academic training from before the Recovery Act to after.

[21] We address this concern using state-specific trends and a specification check using individuals unlikely to be affected by variation in UI approved training.

5.3 Unemployment Insurance and Enrollment

While not specifically intended to promote human capital investments, expansions in UI benefit durations may make schooling more appealing by both reducing the opportunity cost of enrollment and easing credit constraints. We examine how enrollment probabilities of unemployed individuals change as the duration of benefits available to those eligible for UI increases. As changes in state policies, rollout of the EUC program, and unemployment triggers generate most within-state variation in benefit durations, we argue that after appropriately controlling for local labor market conditions, the changes in benefit durations are plausibly exogenous.

Following the framework above, we consider enrollment among the unemployed as a function of benefit availability, D_{ist}:

$$E_{ijt} = \beta_1 X_{ijt} + \alpha_s + \lambda_t + P_z(UR_{st}; \delta) + \beta_2 D_{ist} + \epsilon_{itj} \tag{3}$$

We control for variation in local labor market conditions using a flexible function $P_z(UR_{st}; \delta)$ of the unemployment rate. Here, δ is a vector of coefficients on various polynomials of the unemployment rate. The coefficient on the total weeks of benefits available to an unemployed individual β_2 indicates how further weeks of benefits influence an unemployed individual's propensity to enroll. We use two measures of D_{ist}: (1) the number of weeks available to an individual during the week that they became unemployed, (2) the number of weeks available to individuals during August of the year in which they were interviewed in October.

As discussed previously (and in Rothstein 2011), it is crucial to control for local labor market conditions as the level of benefits covaries with the unemployment rate. We control for these conditions using a flexible function of the state-year unemployment rate $P_z(UR_{st}; \delta)$, including UR_{st} as a linear, quadratic, and cubic term in different

specifications. Remaining variation in D_{ist} comes from the staggered rollout of the EUC, the triggering on and off of benefit tiers, and state decisions about participation in the optional EB program.[22]

There are some threats to the validity of this strategy. First, as a weaker local labor market (higher UR_{st}) lowers the opportunity cost of enrolling, a failure to fully capture this effect might be picked up in the estimates of the impact of longer benefit durations, which are correlated with local labor market conditions.[23] In order to mitigate these concerns, we estimate a large number of specifications which flexibly control for local labor market conditions. We also conduct a specification check by examining the benefit duration response among non job-losers, a population that should not be affected by benefit extensions.

6 Empirical Results

We begin by examining the cyclicality of enrollment using the very different changes in labor market conditions experienced by states over time. For example, while the unemployment rate jumped from 6.5% to 10.1% between 2008 and 2009 in Ohio, the change in North Dakota was a strikingly more modest adjustment of 1 percentage point, rising from 3.1% to 4.1%. Thus, we examine the extent to which larger enrollment responses are found in states with larger cyclical shocks.[24] Our empirical approach begins with the consideration of enrollment behavior measured from individual micro data over more than three decades, beginning in the late 1970s. We next turn to the more recent period, examining the enrollment response in the years leading up to and including the Great Recession.

Focusing on the potential complementarity between UI policy and post-secondary

[22] For further details on the nature of the rollouts of these program see Rothstein (2011).

[23] While decreased opportunity costs make enrolling more appealing, negative income shocks could bring credit constraints into play for many individuals, making the overall effect of local labor market conditions on enrollment ambiguous.

[24] See Figure A1 for an illustration of the variation in unemployment rates and corresponding enrollment rates over time.

participation, we begin by examing whether the enrollment response to unemployment is stronger in states in which policies are more receptive to academic training for those on UI. We then focus on the displaced population, examining the extent to which UI benefit durations affect an individual's propensity to enroll.

6.1 Enrollment and the Labor Market

Table 3 presents regressions of individual enrollment status from the October CPS on covariates including age, race, and sex along with state and year fixed effects. The columns of Table 3 show different periods of observation, ranging from the long horizon of 1978 to 2011 to the more recent years. The rows of the table corespond to specifications differentiated by age, with the first row showing enrollment over the broad age range from 18–40, while subsequent rows show enrollment for 18–19, 20–24, 25–30, and 31–40.[25] The presence of differences in the cyclical effects over the most recent interval may be indicative of broad changes in policies facilitating enrollment (such as greater generosity in the Pell program) or changes in the supply-side of the market such as the entry and expansion of institutions catering to non-residential students.

Starting with the long horizon in Table 3, we find that the aggregate cyclical effect is quite weak – occasionally statistically different from zero and on the order of a tenth of a percentage point per point change in the unemployment rate. Focusing on variation leading up to and during the most recent cyclical downturn (2004-2011) suggests a very different dynamic. Both overall and for specific age groups, we find convincing evidence of countercyclical human capital investments. Notably, while there is a substantial effect of rising unemployment on enrollment for the 18-19 age group (a 5 percentage point rise is predicted to increase the enrollment rate by about 11% or 4.7 percentage points), the proportional effects are much larger for older students; for those ages 20-24 and 25-30, a 5 percentage point increase in the state unemployment rate is associated with a 17% percent

[25] We separate the 20–24 and 25–30 individuals based on the age rules for financial aid status. Individuals turning 24 before January 1 of the year they apply for aid are considered "independent" students. As over 3/4 of 24-year olds in the October survey turned 24 after January 1, we include 24-year olds with the younger age group.

(4.5 percentage point) and a 21% (1.3 percentage point) increase in enrollment, respectively. Enrollment of the oldest group, 31-40, is ayclical over the most recent period.[26]

Focusing on the cyclicality of Pell grant recipients rather than enrollment provides a perspective on how enrollment among the most economically disadvantaged responds to local labor market shocks.[27] Table 4 presents estimates based on the regression of the log of Pell grant recipients on the state level unemployment rate net of year and state fixed effects, similar to the enrollment regressions in Table 3. Over the long period, we see a strong cyclicality in Pell receipt, with a five point increase in the unemployment rate resulting in a fifteen to twenty percent increase in Pell receipt. This effect appears stable across the most recent cyclical downturn, at first surprising given notable changes in Pell generosity and eligibility conditions. However, it is important to keep in mind that our estimates net out any nation-wide effects occuring each year; examining the overall trend in Pell grants indicates that Pell uptake increased substantially beginning in 2009 (Figure 7). As mentioned above, this uptick was likely magnified by a federal Pell grant initiative to encourage displaced workers to retrain.

The countercyclical Pell response occurs across two margins. First, as shown in Table 3, enrollment over the most recent period is countercyclical. Holding the proportion of individuals that are Pell eligible constant, as the labor market contracts and more individuals enroll, the number of Pell recipients will rise.[28] Second, the proportion of individuals that are Pell eligible will rise as family incomes fall during periods of contraction. Thus, we might expect a stronger association between local labor market conditions and the number of Pell recipients than between labor market conditions and enrollment rates. Comparing the effects in Tables 3 and 4, we find that a 5 point rise in the state unemployment rate is associated with a 14% increase in enrollment and a 19%

[26] We drop this group from subsequent analyses given their lack of response to changing labor market conditions and their overall low level of post-secondary enrollment.

[27] Recall that Pell grants are only available to undergraduate students, so the Pell grant response will be concentrated at this level.

[28] However, the Pell eligible population is arguably more likely to be affected by financial constraints during a cyclical downturn, which would attenuate the enrollment response of this group.

increase in the number of Pell recipients.

Using more detailed data from the recent period (2004-2010), we find a larger response in the number of dependent Pell recipients relative to independent recipients, with a five point increase in the unemployment rate leading to a 25 percent increase in the number of dependent Pell recipients. This contrasts with Table 3, where we saw a larger proportional response among 25-30 year olds.[29] However, this result is likely driven by a stronger response to changing labor market condtions among low income dependent students. Splitting our CPS sample by income and examining the enrollment response of individuals 18-19 (who are predominately tied to their parents' household income) suggests that this is indeed the case; examining individuals with household incomes less than $40,000 results in roughly twice the point estimate found in Table 3.[30]

During the most recent recessions, a third factor – changing Pell generosity – may have contributed to the counteryclical response. We attempt to partially quantify the relationship between changing Pell generosity and enrollment by calculating the correlation between year fixed effects recovered from the 1978-2011 regression in Table 3 and the real level of the maximum Pell grant in each of those years. While there is a positive relationship over the entire period (r=.25), the relationship over the 1990-2011 (r=.78) and most recent period, 2004-2011, (r=.89) are substantially stronger.[31]

6.2 Approved Training Policies and the Unemployment-Enrollment Link

We next turn to an examination of how differences in the cost of enrollment, imposed by variation in state UI rules, influence the enrollment decisions of displaced individuals. Marked differences across states in the regulations that determine whether college-level courses are "approved training" should impact within-state cyclicality in enrollment. As

[29] Remember that over 85% of independent students are over the age of 24 by January 1.

[30] Full results available from the authors on request. We generally avoid conditioning on income due to endogeneity concerns, but present this as strong suggestive evidence that reconciles the contrast observed in comparing Tables 3 and 4.

[31] Regressing the fixed effects on the real level of the maximum Pell grant over the most recent period indicates that a $1,000 increase in the real level of the Pell is associated with a 1.4 percentage point increase in the likelihood that an individual is enrolled in college, roughly twice the relationship found in the 1978-2011 period.

discussed above, states that approve post-secondary training for the unemployed impose a lower cost of enrollment on individuals (who are able to maintain UI benefits) relative to states that do not approve similar training.

We find that changes in state labor market conditions have a strong effect on enrollment in states that are receptive to academic training.[32] Table 5 contains estimates of equation (2) ; overall, they indicate that the enrollment effect in states that approve academic courses not directly related to training is more than twice as large as that in states that do not. In these pro post-secondary training states, an increase in the unemployment rate of one point is associated with over a half percentage point increase in enrollment, more than twice the effect in less training-friendly states over the recent period.[33]

As we argue that cross-state differences in UI-approved training are driving this differential enrollment response, we expect to find a larger effect among workers who are more likely to be eligible for UI.[34] We find a substantially larger effect effect among those 25–30 relative to those 20–24. For the 25-30 year old group, a five point increse in the unemployment rate is associated with a more than 25 percent increase in enrollment in states that approve academic training, with no effect in states that do not.

Concern remains, however, that states that approve academic training for individuals on UI are systematically different from states that do not in such a way that cyclical shocks in the states that approve academic training result in larger enrollment impacts separate of this policy difference.[35] We use multiple strategies to address this concern. In column 2 we add state-specific trends, controlling for within-state trends that are potentially correlated with a state's policy regarding approved training. This increases the point estimates somewhat, but still indicates a substantially larger effect in "training friendly" states.

[32] We exclude individuals age 18-19 as they are unlikely to have been employed long enough to receive UI benefits.

[33] Our classification of states' policies is derived from a 2009 survey of state workforce agencies and correspondence with state workforce agencies. Agencies were asked about pre-ARRA and post-ARRA policies; our estimates assume that a state's pre-ARRA classification was unchanged over the recent period (NASWA 2010).

[34] Younger individuals are less likely to have built up the necessary work history to be UI eligible.

[35] For example, such a threat would exist if tuition policy changes were systematically different in states that approved academic training.

We also examine the enrollment response of individuals age 18 and 19. These individuals are likely to be affected by other state policies or differences that drive an enrollment-unemployment rate link, but unlikely to be affected by variation in UI approved training rules. We present these results in Table 5B for individuals 18 and 19. We generally see the same one percentage point affect of the unemployment rate (as in Table 3), but there is no difference in the effect in examining states that approve academic coursework for those on UI, with extremely small and sometimes negative point estimates.

Results from aggregate Pell recipient data support our findings in Table 5. An increase in the unemployment rate by five points results in a 16 percent increase in the overall number of Pell recipients in states that do not approve academic training, but a 22 percent increase in states that do (Table 6). While the point estimates for dependent students are larger, the differential response to local labor market conditions (in academic training approved and non-approved states) is proportionally larger among independent students. While, relative to Table 5, the estimates for independent students suggest a weaker difference between cyclical responses in the two types of states, it is important to keep in mind that the Pell eligible population is likely substantially more constrained than the general population of displaced workers considering enrollment.

6.3 Unemployment Insurance and Enrollment

A second facet of state UI programs may play a role in mangnifying (or attenuating) the response to labor market contractions during the recent period – benefit durations. Increases in UI benefit durations have the potential to ease credit constraints and allow individuals to take advantage of opportunities to retool. We consider two specifications of benefit durations; in the first approach we measure the benefit at the time an individual becomes unemployed. However, it is not entirely clear whether an individual will choose to enroll within a few weeks of losing her job. As our data measure enrollment during the fall, we also estimate specifications using the level of benefits available during the summer prior

to an individual's October interview.[36]

Panel A of Table 7 contains estimates of the effect of the benefit duration available in August on whether or not an individual is enrolled in October.[37] Here, the sample is restricted to job losers, the portion of the unemployed eligible for UI benefits. The estimate in column 1 indicates that an increase in the duration of UI benefits by ten weeks increases the probability of enrollment by a little over 2 percentage points – around 25 percent. Adding quadratic and cubic controls for the unemployment rate in columns 2 and 3 does little to effect the point estimate, perhaps increasing it slightly. The estimates are similarly robust to the inclusion of the UI replacement rate, individual covariates, and state-specific linear trends as well as using state CES employment rates as a measure of labor market conditions.

Panel B presents equivalent estimates using the benefit duration available to individuals at the point when they became unemployed. We combine employment status and unemployment duration information to generate the week in which an individual became unemployed; we then link these data with the number of weeks available and labor market conditions at that point. Results remain quite similar to those presented in Panel A, although significance is somewhat reduced.

We estimate this effect separately for states that do or do not approve academic coursework unrelated to an eventual occupation for individuals receiving UI. Although not statistically distinguishable, as expected, the effect of additional weeks of UI benefits is larger in states that are more supportive of academic training.[38]

As a specification check, we present results of similar specifications estimated for entrants, job leavers, and reentrants in Table 8. As most of these individuals are not eligible to receive unemployment compensation, we expect a much smaller, or perhaps zero,

[36]Specifically we present estimates using the benefit levels available during August of the summer prior to the individual's October interview.

[37]The variable is transformed into $\frac{D_{st}}{10}$.

[38]Results not presented in table: Panel A: .0236 (se .0163) in approving states versus .0150 (se .0131) in non-approving and Panel B: .0491 (se .0194) versus .0152 (se .0196)

effect for them.[39] The regression results are consistent with this hypothesis, with small and insignificant point estimates in most specifications.

These results suggest that UI benefits may play an important role for displaced workers in reducing the cost of investing in additional human capital. While we are unable to distinguish this effect empirically, it is likely that a portion of the enrollment effect is driven by an easing of credit constraints that would otherwise make enrollment infeasible.[40]

7 Conclusion

Our analysis of the college enrollment response during the Great Recession and the years leading up to it shows an unambiguous and substantial link between adverse local economic conditions, as measured by the unemployment rate, and college enrollment. While the absolute value of these effects is larger for students of traditional college age, the proportional effects are larger for somewhat older students.

Indeed, the cyclical response in enrollment observed in the last decade is appreciably greater than that observed in economic downturns in prior decades. One factor is that the increased availability of federal financial aid – including relative increases in the generosity of Pell grants and the extension of student loan limits near the start of the Great Recession – may have reduced the challenges to financing college in adverse economic conditions.

Focusing more narrowly on post-secondary access for displaced workers, we find that policy differences among states in the extent to which college course work is a recognized form of training have a substantial effect on enrollment responses to cyclical downturns. Because such differences are broadly "fixed" over time, we are not able to fully distinguish the effects of the policy per se. Rather, we focus on how this policy variation magnifies the enrollment effect of labor market contractions. We find that the states with policies

[39] Similarly, estimates for the full sample of individuals (not presented) have extremely small, insignificant, and often negative coefficients

[40] As noted in a 2010 article, an unemployed female "counted on her unemployment checks to provide a meager income, because the time she spends on her classes dont leave her time to also hold a job." The article goes on to discuss how this particular displaced worker would be forced to drop out as the government had decided not to extend unemployment compensation longer (Gautz 2010).

favoring post-secondary access for displaced workers unambiguously experienced larger enrollment responses to the recent downturn. Furthermore, this differential response is not observed among younger individuals who are unlikely to be affected by this policy variation, consistent with the observed differences in the response of the older population being driven by differences in UI rules that essentially shift the cost of enrolling.

We find that UI benefit durations play a similar role in affecting the cost of enrollment. The duration of unemployment benefits available has a substantial impact on enrollment propensities, with an additional 10 weeks of benefits increasing enrollment likelihoods by around 2 percentage points, implying a relative adjustment of about 25%. Our results suggest that "active labor market policies" – including UI and job training programs – are potentially quite intertwined with post-secondary policies. Whether the demonstrated responsiveness of enrollment to benefit generosity complements the objective of helping workers invest in skills that improve long-term labor market outcomes is an important question for future work.

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8 Appendix: Data and Methods

A. October CPS and Pell Grant Data

We use the October CPS (Education Supplement) from 1978 through 2011. We restrict the sample to individuals age 18 to 40 and focus on college enrollment unless otherwise noted. We do not condition on high school graduation which is likely also affected by changing labor market conditions.

Our Pell data are in two files obtained from the U.S. Department of Education via http://www2.ed.gov/finaid/prof/resources/data/ope.html. Our first data series contains the aggregate number of Pell recipients in each state and year from 1978-2010. Our second data series contains similar figures broken down by financial aid status (independent vs. dependent) and institutional control (public, private, for-profit) from 2004-2010.

B. Tuition and Appropriation Data

Our data on state tuition levels from the 1978-79 through 2009-10 school years were obtained from the Washington Higher Education Coordinating Board annual Tuition and Fee Rates: A National Comparison publications, obtainable at the website of the Washington Student Achievement Council (http://www.wsac.wa.gov/). Our data on state appropriation levels were obtained from the Grapevine survey, currently published by the Center for the Study of Education Policy at Illinois State University.

C. Unemployment Classifications and Benefit Duration Assignment

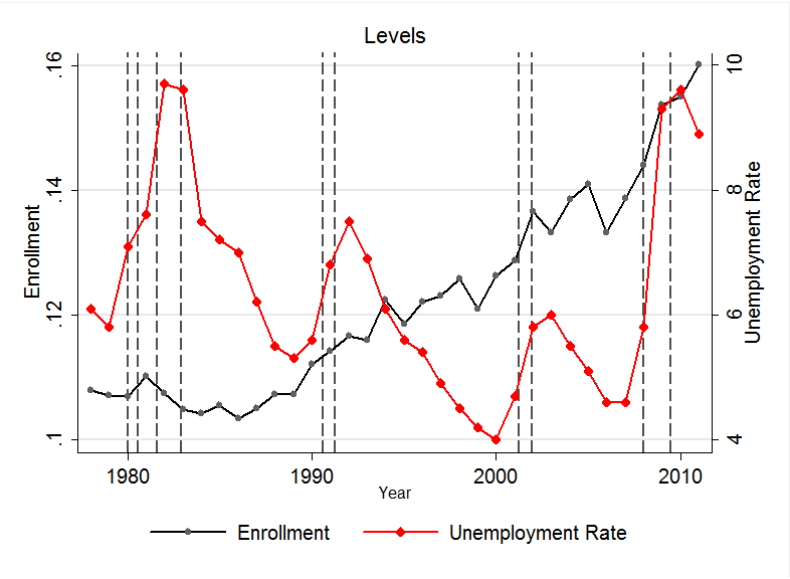
We classify unemployed individuals as job losers or non-job losers based on their reason for unemployment. Individuals who lost their job or are on layoff are considered job losers, while job leavers, re-entrants, and new-entrants are classified as non-job losers. We assign expected UI benefit durations D_{isym} for an individual i displaced in state s in year y and month m using two assignment rules:

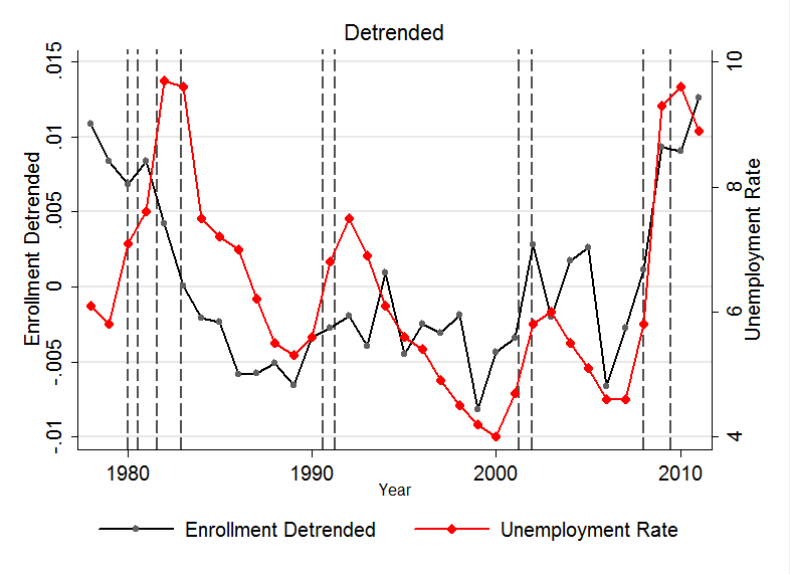
1. We use the number of months available to an individual in state s in August of the year y in which an individual is interviewed in October: $D_{isym} = D_{isy\mathbf{Aug}}$

2. We use the number of months available to an individual in state s in month m of the year y in which an individual became unemployed. We calculate this month and year using the survey response information on unemployment duration.

We use two measures of state labor market conditions: the BLS unemployment rate and CES employment figures. For specification (i.) we use the measure of labor market conditions in August of the year y in which an individual is interviewed in October. For specification (ii.) we use the measure of labor market conditions in the month and year in which an individual became unemployed.

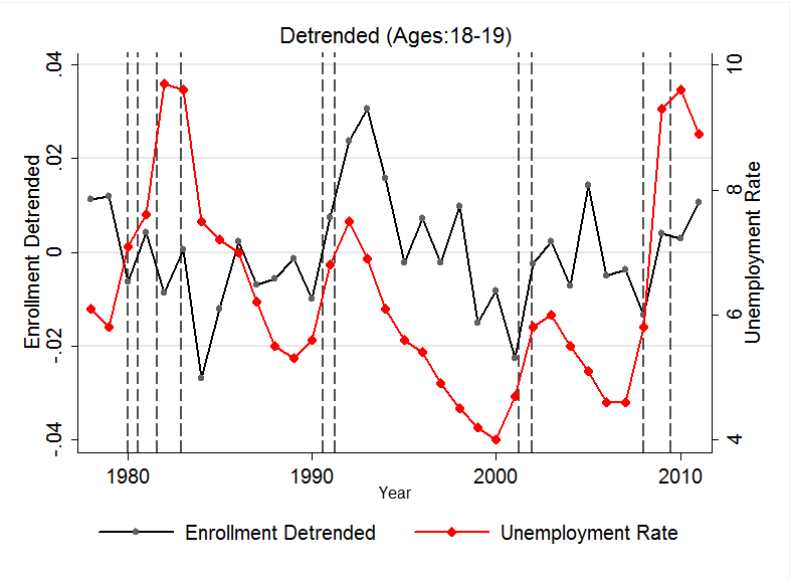
Figure 1: College Enrollment Rate by Year





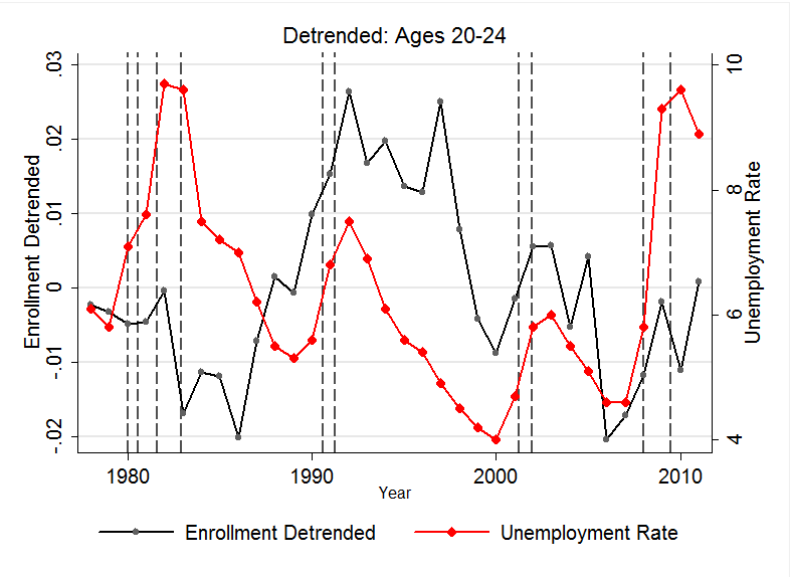
Note: Fraction enrolled calculated as the (weighted) proportion of individuals 18-40 enrolled during October of each year using the October CPS. All detrended enrollment series depict residuals from a specification using a linear trend (results are similar using a quadratic or cubic specification).

Figure 2: College Enrollment by Year (Age: 18-19)



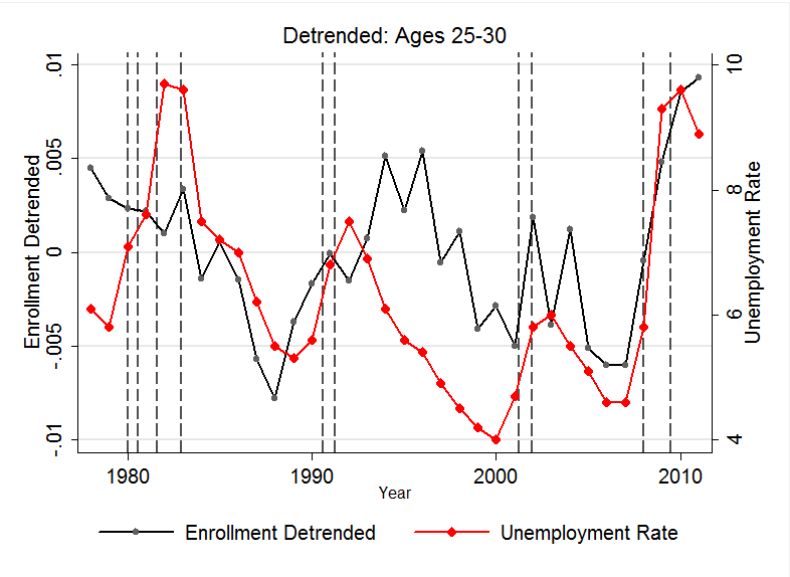
Note: Fraction enrolled calculated as the (weighted) proportion of individuals 18-19 enrolled during October of each year using the October CPS.

Figure 3: College Enrollment by Year (Age: 20-24)



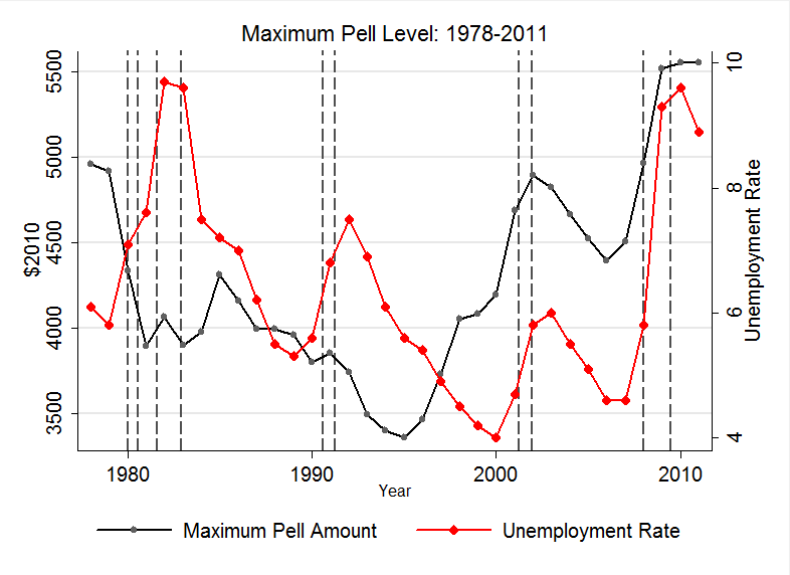
Note: Fraction enrolled calculated as the (weighted) proportion of individuals 20-24 enrolled during October of each year using the October CPS.

Figure 4: College Enrollment by Year (Age: 25-30)



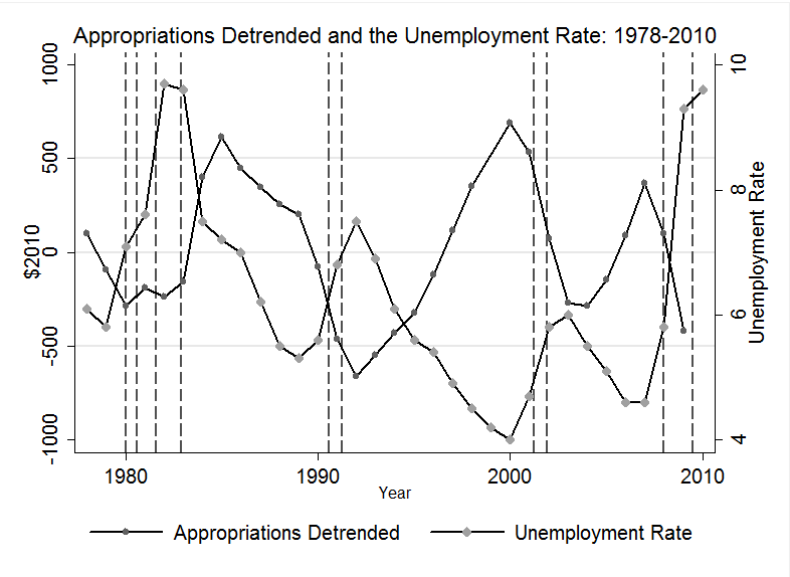
Note: Fraction enrolled calculated as the (weighted) proportion of individuals 20-24 enrolled during October of each year using the October CPS.

Figure 5: Real Value of the Maximum Pell Grant by Year



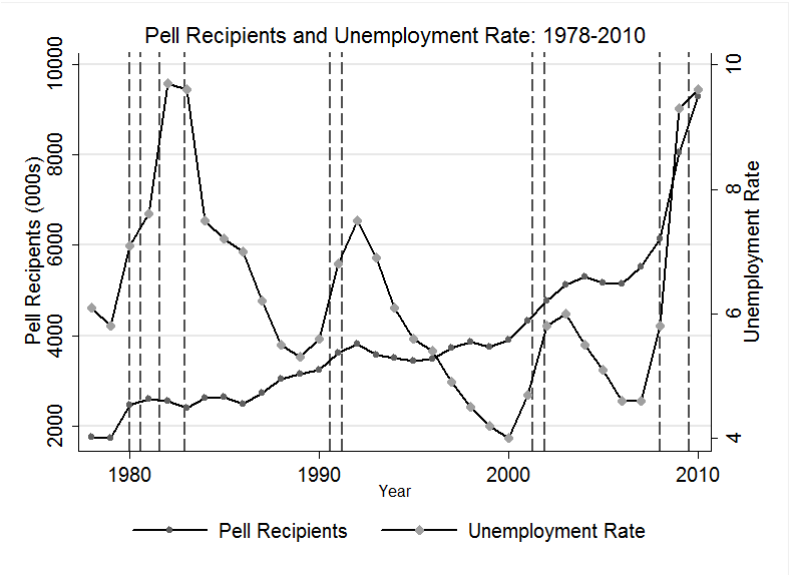
Note: Maximum Pell amounts deflated using the Consumer Price Index.

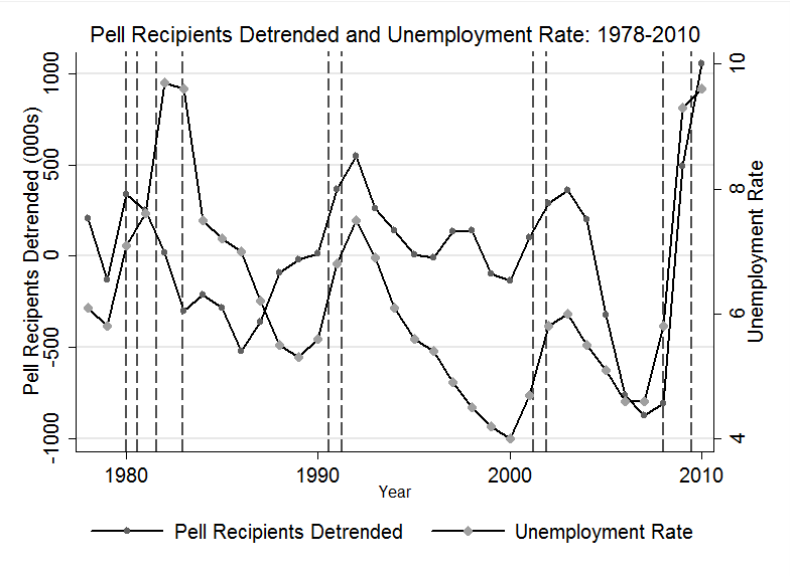
Figure 6: Mean State Appropriations to Institutions of Higher Education (detrended)



Note: Includes ARRA funding provided to states in 2009. Appropriation levels obtained from the Grapevine survey (see Data Appendix for additional information). All detrended series depict residuals from a specification using a linear trend (results are similar using a quadratic or cubic specification).

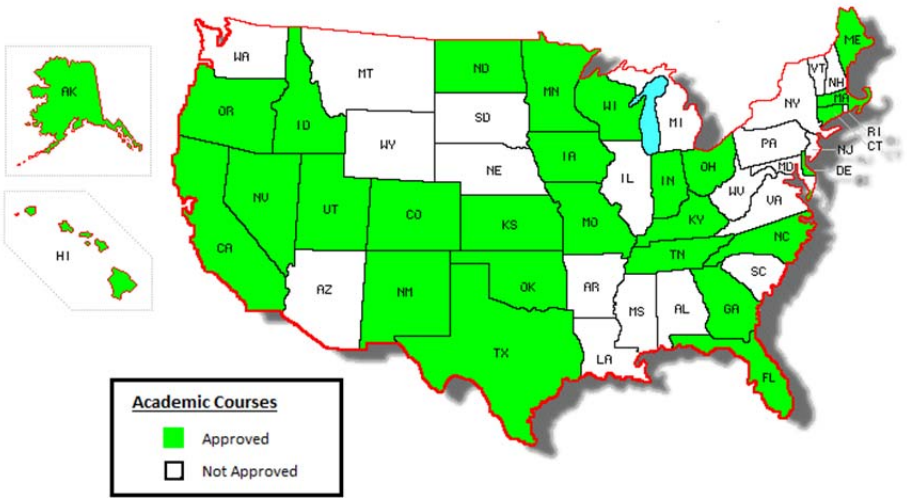
Figure 7: Pell Recipients by Year





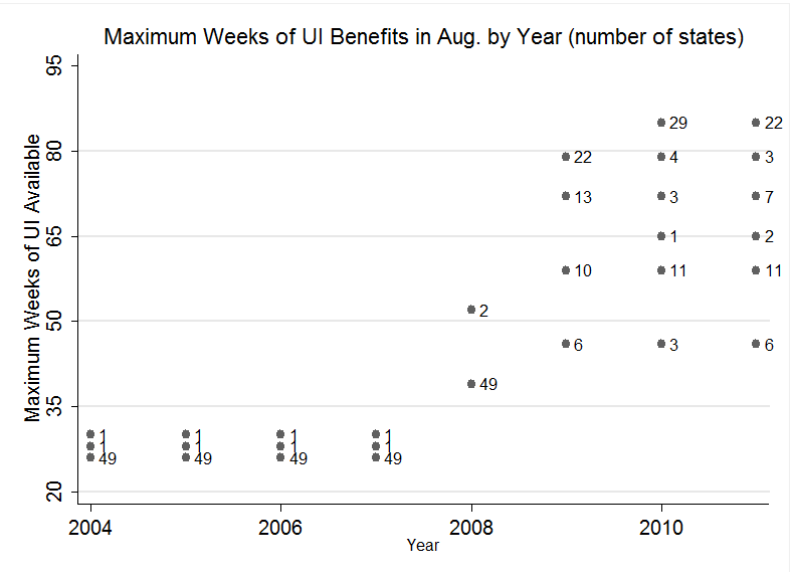
Note: Pell recipient figures obtained from U.S. Department of Education (see Data Appendix for more information). All detrended series depict residuals from a specification using a linear trend (results are similar using a quadratic or cubic specification).

Figure 8: State Approved Training for UI recipients



Note: Indicates state response to the question "Academic courses not leading to a specific occupation allowed as approved training?" Data obtained from the National Association of State Workforce Agencies, state websites, and correspondence with state employment commissions (NASWA 2010).

Figure 9: Variation in Maximum UI Benefit Duration (Aug.)



Note: The figure presents the distribution of states by maximum weeks of UI benefits available in August of each year, by year (see Data Appendix and Rothstein (2011) for additional information).

TABLE 1

COLLEGE ENROLLMENT: 2004-2011

	All		Age(18-19)		Age(20-24)		Age(25-30)		Age(31-40)	
Year	All	Unemp.	All	Unemp.	All	Unemp.	All	Unemp.	All	Unemp.
2004	13.9%	12.4%	47.7%	27.6%	30.3%	19.5%	7.2%	6.1%	3.2%	3.2%
2005	14.1%	11.6%	49.3%	25.9%	31.7%	17.3%	6.6%	9.1%	3.1%	1.3%
2006	13.3%	10.4%	46.3%	20.4%	29.7%	14.3%	6.6%	7.5%	2.9%	3.7%
2007	13.9%	9.9%	48.7%	22.6%	30.5%	14.6%	6.7%	5.4%	3.0%	2.6%
2008	**14.4%**	**10.8%**	**48.3%**	**26.5%**	**31.5%**	**15.9%**	**7.4%**	**5.1%**	**3.3%**	**4.6%**
2009	15.4%	12.4%	49.8%	30.3%	33.1%	18.3%	8.0%	8.2%	3.8%	5.5%
2010	15.5%	13.7%	50.8%	33.4%	32.6%	18.8%	8.5%	9.1%	4.0%	5.6%
2011	16.0%	13.1%	50.0%	31.3%	34.3%	19.1%	8.6%	8.6%	3.9%	5.1%
N	1,561,505	50,640	128,276	7,254	321,574	13,286	416,828	12,354	694,827	17,746

Note: All includes individuals aged 18-40. Averages calculated using October CPS weights.

TABLE 2

CHARACTERISTICS OF UNEMPLOYED BY ENROLLMENT STATUS: 2004-2011

	All		Job Losers		Non-Job Losers	
Characteristic	Enrolled	Not Enrolled	Enrolled	Not Enrolled	Enrolled	Not Enrolled
Age	23.07	27.82	26.35	29.66	22.07	26.10
Male	0.48	0.56	0.48	0.63	0.48	0.47
Black	0.21	0.24	0.22	0.22	0.21	0.25
Hispanic	0.15	0.21	0.14	0.22	0.16	0.20
Unemp. Duration	19.89	23.63	23.50	23.23	19.36	24.63

Note: Includes 18,363 individuals age 18-40 from October CPS years 2004-2011. Averages calculated using CPS weights. Job Losers defined as those who lost their job or were laid off. Non-Job Losers defined as those who are job leavers, re-entrants, or new entrants.

TABLE 3

UNEMPLOYMENT RATE AND COLLEGE ENROLLMENT

Sample	Mean (DV)	1978-2011	1978-2011	2003-2011	2004-2011
All					
UNEMP. RATE ("UR")	0.12	0.000121	0.00112**	0.00330***	0.00321***
		(0.000482)	(0.000431)	(0.000818)	(0.000905)
Ages: 18-19					
UNEMP. RATE ("UR")	0.43	-0.00186	-0.00110	0.0101***	0.00939**
		(0.00185)	(0.00177)	(0.00366)	(0.00389)
Ages: 20-24					
UNEMP. RATE ("UR")	0.26	0.000592	0.00240**	0.00880***	0.00893**
		(0.00112)	(0.00105)	(0.00314)	(0.00341)
Ages: 25-30					
UNEMP. RATE ("UR")	0.06	0.000206	0.000845	0.00245*	0.00254*
		(0.000510)	(0.000633)	(0.00124)	(0.00128)
Ages: 31-40					
UNEMP. RATE ("UR")	0.03	0.000230	0.000852***	-0.000578	-0.000942
		(0.000366)	(0.000285)	(0.000742)	(0.000819)
State Trends		No	Yes	No	No

Note: All specifications include year and state fixed effects as well as indicator variables for sex, race, and age. All ages includes individuals age 18-40. Means presented for 1978-2011. Corresponding means for more recent sample period are .145, .49, .32, 07, and .03 respectively. Robust standard errors clustered at the state level are in parentheses.
***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 4

UNEMPLOYMENT RATE AND LOG PELL RECIPIENTS

	1978-2010	1978-2010	2003-2010	2004-2010
All				
UNEMP. RATE ("UR")	0.0393***	0.0417***	0.0385***	0.0370***
	(0.00537)	(0.00467)	(0.00758)	(0.00772)
Dependents				
UNEMP. RATE ("UR")				0.0514***
				(0.00695)
Independents				
UNEMP. RATE ("UR")				0.0293***
				(0.00922)
State Trends	No	Yes	No	No

Note: All specifications include year and state fixed effects. Observations are the log of the number of Pell recipients at the state-year level. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 5A

UNEMPLOYMENT RATE AND ENROLLMENT BY STATE POLICY

Variable	2003-2011	2003-2011	2004-2011
All			
UNEMP. RATE ("UR")	0.00227	-0.000243	0.00201
	(0.00261)	(0.00299)	(0.00277)
*UR*ACADEMICS APP*	0.00334*	0.00530**	0.00341*
	(0.00185)	(0.00208)	(0.00187)
Ages: 20-24			
UNEMP. RATE ("UR")	0.00706	0.00552	0.00708
	(0.00456)	(0.00473)	(0.00478)
*UR*ACADEMICS APP*	0.00199	0.00382	0.00187
	(0.00336)	(0.00331)	(0.00339)
Ages: 25-30			
UNEMP. RATE ("UR")	-0.00162	-0.00507	-0.00211
	(0.00190)	(0.00321)	(0.00203)
*UR*ACADEMICS APP*	0.00451***	0.00675***	0.00473***
	(0.00116)	(0.00198)	(0.00116)
State Trends	No	Yes	No

Note: All specifications include year and state fixed effects as well as indicator variables for sex, race, and age. All includes individuals 20-30 in the October CPS. Sample size for this group (2003-2011) is 165,977. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 5B

UNEMPLOYMENT RATE AND ENROLLMENT BY STATE POLICY (18-19)

Variable	2003-2011	2003-2011	2004-2011
UNEMP. RATE ("UR")	0.00967	0.00601	0.0105
	(0.00617)	(0.00805)	(0.00642)
*UR*ACADEMICS APP*	0.000339	-0.00339	0.000159
	(0.00437)	(0.00578)	(0.00460)
State Trends	No	Yes	No
N	30,670	30,670	27,149

Note: All specifications include year and state fixed effects as well as indicator variables for sex, race, and age. Observations for individuals 18-19 in the October CPS. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 6

UNEMPLOYMENT RATE AND LOG PELL GRANTS BY STATE POLICY

Variable	2003-2010	2003-2010	2004-2010
All			
UNEMP. RATE ("UR")	0.0321***	0.0101*	0.0301***
	(0.0107)	(0.00556)	(0.0103)
*UR*ACADEMICS APP*	0.0123**	0.00933***	0.0125**
	(0.00595)	(0.00343)	(0.00530)
Dependent			
UNEMP. RATE ("UR")			0.0414***
			(0.00768)
*UR*ACADEMICS APP*			0.0150***
			(0.00382)
Independent			
UNEMP. RATE ("UR")			0.0242*
			(0.0124)
*UR*ACADEMICS APP*			0.0115*
			(0.00632)
State Trends	No	Yes	No

Note: All specifications include year and state fixed effects. Observations are the log of the number of Pell recipients at the state-year level. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 7

IMPACT OF WEEKS OF UI BENEFITS ON ENROLLMENT OF JOB LOSERS (2004-2011)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Benefits Weeks / 10	0.0224**	0.0203**	0.0203**	0.0207**	0.0189**	0.0242*	0.0158*	0.0208**	0.0184**
	(0.0092)	(0.0089)	(0.0089)	(0.0088)	(0.0084)	(0.0123)	(0.0086)	(0.0085)	(0.0078)
Panel B									
Benefits Weeks / 10	0.0271**	0.0246*	0.0246*	0.0249*	0.0247*	0.0166	0.0218*	0.0209	0.0196
	(0.0128)	(0.0129)	(0.0129)	(0.0129)	(0.0125)	(0.0179)	(0.0125)	(0.0130)	(0.0127)
Unemployment Rate	Linear	Quad	Cubic	Quad	Quad	Quad	Quad		
UI Replacement Rate				Y					
Individual Covariates					Y	Y	Y	Y	Y
State by Year Trends						Y			
Unemp. Duration							Y		
Log Employment								Y	
Δ Log Employment									Y

Note: Panel A uses the weeks of benefits available to an individual in August of the year in which they are interviewed in October. Panel B uses the number of weeks of benefits available at the point they became unemployed. All specifications include year and state fixed effects. Sample restricted to displaced unemployed individuals aged 20-30 from October CPS (2004-2010). Sample size is 3,421. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.

TABLE 8

IMPACT OF WEEKS OF UI BENEFITS ON ENROLLMENT OF NON JOB LOSERS (2004-2011)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A									
Benefits Weeks / 10	-0.0018	0.0049	0.0049	0.0050	0.0022	0.0148	0.0024	-0.0004	0.0064
	(0.0109)	(0.0119)	(0.0119)	(0.0120)	(0.0111)	(0.0139)	(0.0114)	(0.0087)	(0.0102)
Panel B									
Benefits Weeks / 10	-0.0113	-0.0026	-0.0026	-0.0023	-0.0058	0.0097	-0.0054	-0.0066	0.0032
	(0.0130)	(0.0141)	(0.0141)	(0.0142)	(0.0135)	(0.0184)	(0.0140)	(0.0116)	(0.0118)
Unemployment Rate	Linear	Quad	Cubic	Quad	Quad	Quad	Quad		
UI Replacement Rate				Y					
Individual Covariates					Y	Y	Y		
State by Year Trends						Y			
Unemp. Duration							Y		
Log Employment								Y	
Δ Log Employment									Y

Note: Panel A uses the weeks of benefits available to an individual in August of the year in which they are interviewed in October. Panel B uses the number of weeks of benefits available at the point they became unemployed. All specifications include year and state fixed effects. Sample restricted to displaced unemployed individuals aged 20-30 from the October CPS. Sample size is 5,247. Robust standard errors clustered at the state level are in parentheses. ***Significant at the 1 percent level. **Significant at the 5 percent level. *Significant at the 10 percent level.