

The upside of down: Postsecondary enrollment in the Great Recession

Lisa Barrow and Jonathan Davis

Introduction and summary

Following the Great Recession (December 2007 through June 2009), the official U.S. unemployment rate reached the highest levels recorded since the early 1980s, peaking at 10.0 percent in October 2009 (see figure 1). However, what really distinguishes the Great Recession from past episodes of high unemployment is the long-term unemployment rate (the percentage of the civilian labor force unemployed for more than 26 weeks). Following the Great Recession, the long-term unemployment rate was nearly double the highest levels seen in the last 50 years, reaching 4.4 percent in April 2010.¹ High unemployment is costly. Davis and von Wachter (2011) show that, on average, men lose 2.8 years of their predisplacement earnings when the unemployment rate exceeds 8 percent at the time they are displaced from their jobs—double the earnings losses they experience when unemployment is below 6 percent when they are displaced.² Further, Kalil and Ziol-Guest (2008) show that children whose father is displaced from his job have higher grade repetition and school discipline rates. At the same time, however, poor prospects in the labor market may induce individuals to make greater investments in their human capital by staying in or returning to school.

Many past studies have investigated the cyclical nature of school enrollment, and most of the evidence suggests that enrollment increases during recessions. Gustman and Steinmeier (1981) looked at the enrollment/labor supply decision of teenagers in 1976 and found that school enrollment rates were affected by both the area unemployment rate and wage offers. Mattila (1982) examined the determinants of enrollment for 16- to 21-year-old males between 1956 and 1979. Although he was primarily interested in how the rate of return to schooling affects enrollment, he also found that college enrollment rates for younger men increased with an increase in the unemployment rate, but the same was not true for the older men in his analysis.

In one of the few studies to investigate the enrollment–unemployment association across the entire population, Betts and McFarland (1995) found that a 1 percent increase in the adult unemployment rate was associated with a 4 percent increase in full-time community college enrollment. Similarly, Dellas and Sakellaris (2003) studied higher education enrollment and the business cycle for 18 to 22 year olds and found that college enrollment is strongly countercyclical. On the other hand, Card and Lemieux (2001) find that the state unemployment rate has no effect, or a slightly negative effect, on the college enrollment rates of 18- to 21-year-old men and women. Finally, other studies

Lisa Barrow is a senior economist in the Economic Research Department at the Federal Reserve Bank of Chicago and Jonathan Davis is a PhD student at the Harris School of Public Policy at the University of Chicago.

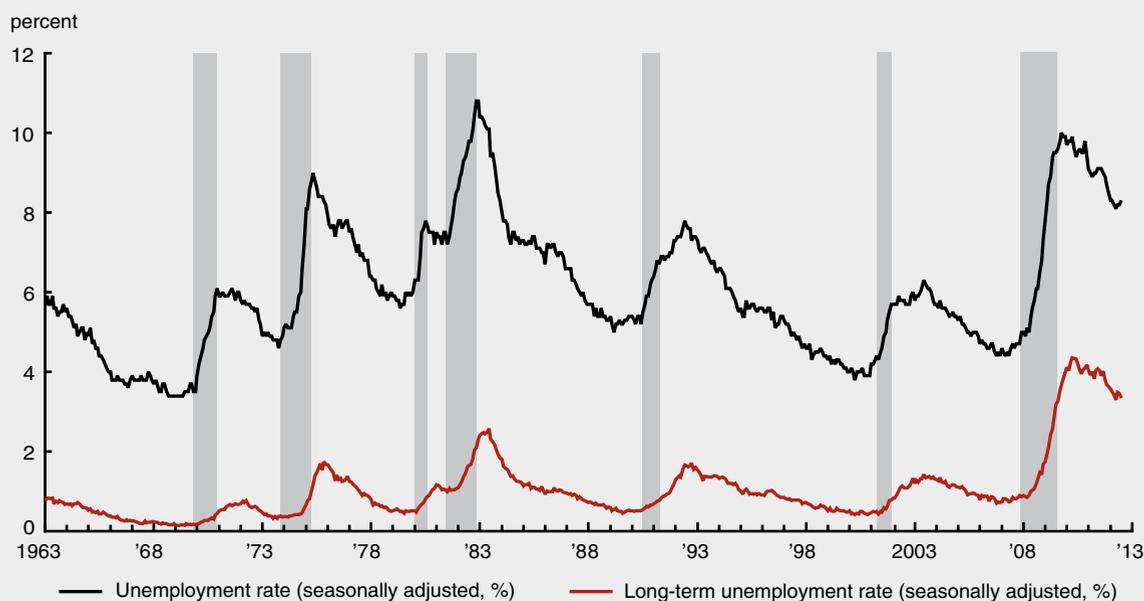
© 2012 Federal Reserve Bank of Chicago

Economic Perspectives is published by the Economic Research Department of the Federal Reserve Bank of Chicago. The views expressed are the authors' and do not necessarily reflect the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.

Charles L. Evans, *President*; Daniel G. Sullivan, *Executive Vice President and Director of Research*; Spencer Krane, *Senior Vice President and Economic Advisor*; David Marshall, *Senior Vice President, financial markets group*; Daniel Aaronson, *Vice President, microeconomic policy research*; Jonas D. M. Fisher, *Vice President, macroeconomic policy research*; Richard Heckinger, *Vice President, markets team*; Anna L. Paulson, *Vice President, finance team*; William A. Testa, *Vice President, regional programs*; Richard D. Porter, *Vice President and Economics Editor*; Helen Koshy and Han Y. Choi, *Editors*; Rita Molloy and Julia Baker, *Production Editors*; Sheila A. Mangler, *Editorial Assistant*.

Economic Perspectives articles may be reproduced in whole or in part, provided the articles are not reproduced or distributed for commercial gain and provided the source is appropriately credited. Prior written permission must be obtained for any other reproduction, distribution, republication, or creation of derivative works of *Economic Perspectives* articles. To request permission, please contact Helen Koshy, senior editor, at 312-322-5830 or email Helen.Koshy@chi.frb.org.

ISSN 0164-0682

FIGURE 1**Unemployment and long-term unemployment, January 1963 to July 2012**

Note: Shaded bars indicate recessions as defined by the National Bureau of Economic Research.
 Source: Authors' calculations based on data from Haver Analytics.

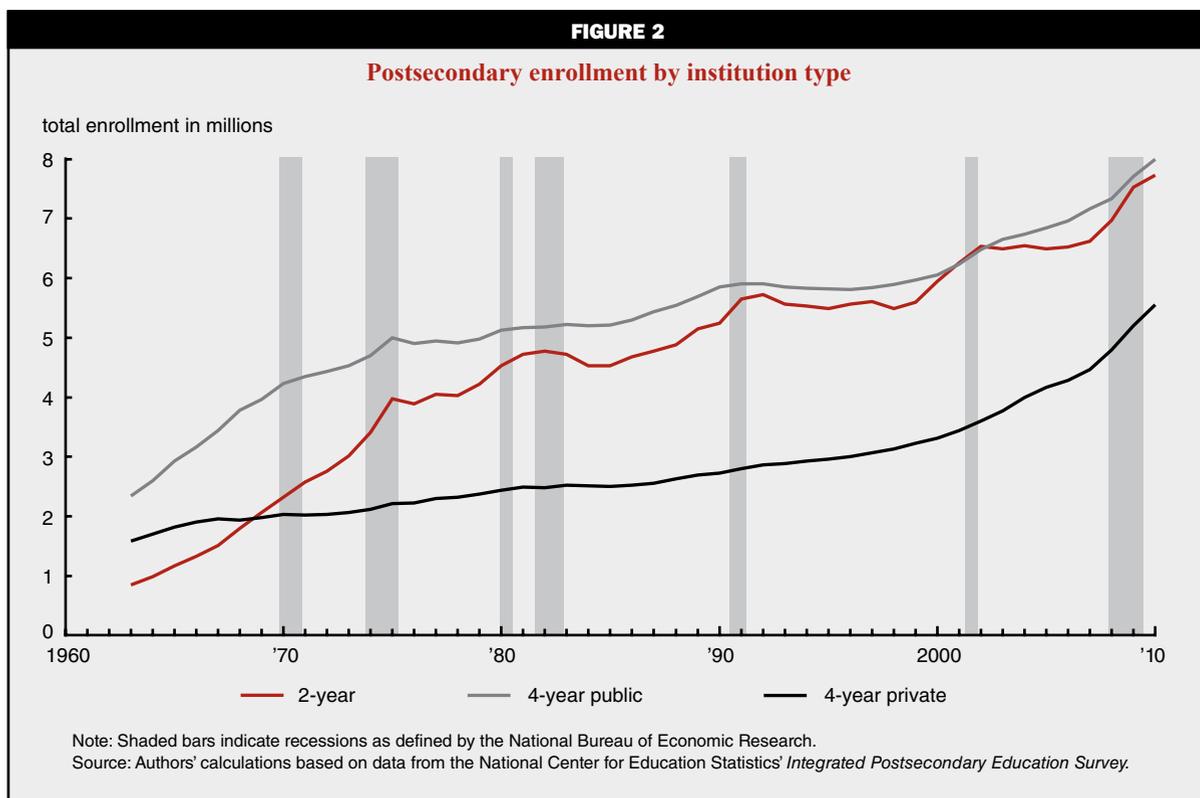
have shown that returning to school after being displaced from a job can reduce the labor market costs of the displacement. For example, Jacobson, LaLonde, and Sullivan (2005) find that community college retraining for displaced workers results in a 7 percent increase in postdisplacement earnings for the average male participant and a 14 percent increase for the average female participant. However, the returns to additional education might be lower during a recession. Kahn (2010) showed that graduating from college in a poor labor market has a persistent, negative effect on labor market outcomes.

In this article, we examine how postsecondary enrollment changed during the Great Recession and how this change compared with earlier recessionary periods. We do this for the entire population 16 years and older, we consider enrollment changes at different types of institutions, and we examine whether enrollment may be more sensitive to changes in the long-term unemployment rate. We show that there have been large increases in two-year, four-year public, and four-year private enrollment since the start of the Great Recession. These increases are slightly larger than we would have expected based on the historical relationships between unemployment and enrollment, and they are significantly larger than we would have expected if the unemployment rate had remained at 2007 levels.

Using a simple cost–benefit analysis, we estimate that the increased enrollment may lead to a net lifetime benefit of roughly \$3.3 billion overall, or \$1,500 for each person who enrolled.

Theoretical predictions

The standard model of school enrollment predicts that individuals will enroll in school until the marginal cost of an additional year of education exceeds the marginal benefit. In a simple cost–benefit framework, this means that the present discounted value of the additional income one would earn from further schooling must be greater than all of the costs associated with getting that further schooling. Of all of the costs of getting more schooling, forgone earnings for hours spent in school rather than spent working are likely to be among the largest. For example, average tuition and fees for students at two-year colleges in 2008–09 was \$2,600³ in 2009–10 dollars.⁴ In contrast, the average high school graduate in the labor force made \$28,089 in 2007 and \$27,189 in 2010.⁵ Even at minimum wage (\$7.25/hour), an individual working 30 hours a week for 40 weeks would earn \$8,700. Thus, in times of high unemployment, the opportunity cost of getting additional schooling may be substantially lower than in times of very low unemployment. If there is no change in the expected total benefits of getting more schooling, one



would expect to observe increases in school enrollment rates during recessions.

Data

For our analysis, we use enrollment data from the National Center for Education Statistics' *Integrated Postsecondary Education Survey* (IPEDS) and the October Supplement of the U.S. Bureau of Labor Statistics' *Current Population Survey* (CPS). We also use U.S. Census population data and CPS labor market data.⁶ The IPEDS data include fall enrollment information for all degree-granting, postsecondary institutions that participate in federal financial aid programs from 1963 through 2010. Importantly, all institutions that participate in federal financial aid programs authorized under title IV of the Higher Education Act of 1965 are required to respond to the IPEDS survey. We use fall enrollment counts (on October 15 or the institution's official fall reporting date). In figure 2, we present total enrollment at two-year, four-year public, and four-year private postsecondary institutions from 1963 through 2010 (as of October of each year), along with shading for recessionary periods according to the National Bureau of Economic Research.⁷ Total enrollment at all institution types generally rose over the entire period. Between 1963 and 1975, enrollment at two-year and four-year

public institutions more than doubled as the baby boomers entered college and federal financial aid programs were implemented and expanded following the Higher Education Act of 1965. By 2010, total enrollment at title IV institutions had reached 21.3 million, with 7.7 million students enrolled at two-year institutions, 8 million students enrolled at four-year public institutions, and the remainder enrolled at four-year private institutions. Enrollment at two-year institutions experienced the highest growth over the entire period, but growth in enrollment at four-year private institutions rose sharply after 2000, driven by the increase in enrollment at the growing number of for-profit four-year institutions.⁸

Some of the rise in enrollment is driven by increases in the population, while at the same time one can see from figure 2 that enrollment levels—particularly at two-year institutions—seem to move over the business cycle as well. In order to look at population enrollment rates, we convert the IPEDS enrollment levels to enrollment rates using Census estimates of the population aged 16 and over.⁹ In addition, we use data from the CPS October Supplement to estimate enrollment rates for individuals aged 16 years and over from 1978 through 2010.¹⁰ From these CPS data, we can also calculate enrollment rates at four-year public,

four-year private, and two-year postsecondary institutions. We present enrollment rates constructed from these data sources in figure 3, panels A and B.

In principle, the IPEDS and CPS enrollment data should be nearly identical. In figure 3, panel A, we see that, indeed, the overall enrollment rate series are quite similar over most years, although CPS enrollment rates exceed IPEDS enrollment rates by up to 0.7 percentage points between 1994 and 2002.¹¹ Overall, the enrollment rate of the population aged 16 and over rose from roughly 6.7 percent in 1978 to 8.6 percent in 2010. However, when enrollment is stratified by type of institution, the levels and trends in the data are very different. The enrollment rate at four-year public institutions as measured by the IPEDS has been relatively flat since the late 1970s at just under 3 percent, rising somewhat around periods of recession, and hitting a record level of 3.3 percent in 2010. In contrast, the four-year public enrollment rate as measured by the CPS rose from 3.2 percent in 1978 to 4.2 percent in 2010. For two-year institutions, the CPS enrollment rate is consistently below the IPEDS enrollment rate by an average of 0.6 percentage points; and most recently, the CPS measured no increase in the enrollment rate at four-year private institutions, compared with an increase of roughly 2 percentage points in the IPEDS data. Because the IPEDS data are based on administrative data from the universe of title IV institutions and the CPS data are based on surveys of individuals, we suspect some of the differences are driven by individual misreporting of institution type in the CPS. As a result, we focus on estimates based on IPEDS enrollment rates. However, we discuss how the results differ when the CPS is used, as well as using CPS data to decompose the change in the overall enrollment rate observed in the CPS by labor force status.

Focusing on the IPEDS data during the period of the Great Recession, we see that the two-year enrollment rate has increased by 13 percent since 2007 after decreasing or staying roughly constant in each year between 2002 and 2007. The enrollment rate at four-year public institutions was increasing in the years leading up to the Great Recession, but the rate of increase accelerated during the Great Recession; the four-year public enrollment rate increased 8.1 percent (from 3.03 percent to 3.28 percent) between 2007 and 2010, compared with an increase of 2.6 percent (from 2.96 percent to 3.03 percent) between 2004 and 2007.

The enrollment rate at private four-year institutions has increased quite dramatically since 2000, and like the four-year public enrollment rate, the growth in the four-year private enrollment rate accelerated during the Great Recession relative to the mid-2000s. Between

2004 and 2007, the enrollment rate at four-year private institutions increased by 7.9 percent (from 1.75 percent to 1.89 percent), while it grew by 20.5 percent between 2007 and 2010 (from 1.89 percent to 2.28 percent).

Enrollment and labor market conditions before the Great Recession

While it is clear from figure 3 that postsecondary enrollment increased during the Great Recession, it is unclear whether it has increased by more or less than one would have expected given its trend growth and the relationship between labor market conditions and enrollment in the past. To examine this question, we model the change in the enrollment rate as follows:

$$\Delta Enrollment_t = \alpha + \beta \Delta Unemployment_t + \gamma_t + \varepsilon_t,$$

where $\Delta Enrollment_t$ is the change in the aggregate total, two-year, four-year public, or four-year private enrollment rate between year $t-1$ and t ; $\Delta Unemployment_t$ is the change in the annual unemployment rate or the annual long-term unemployment rate between year $t-1$ and t ; t is a time trend; ε_t is the error term; and α , β , and γ are parameters to be estimated. We estimate this model using linear regression with data from 1975 through 2007 so we can compare the enrollment data during the Great Recession with an out-of-sample forecast using the model estimated prior to the Great Recession.¹²

In table 1, we present estimates of the relationships between changes in the enrollment rates and 1) the change in the overall unemployment rate and 2) the change in the long-term unemployment rate. Each column corresponds to a different enrollment rate measure. As shown in column 1, a 1 percentage point increase in the change in the unemployment rate is associated with a 0.11 percentage point increase in the change in the total enrollment rate, an association that is significant at the 1 percent level.¹³ If all of the additional increase in enrollment was coming from the newly unemployed (with nobody exiting the labor force), this increase would translate into roughly 16 percent of the additional unemployed enrolling in school.¹⁴

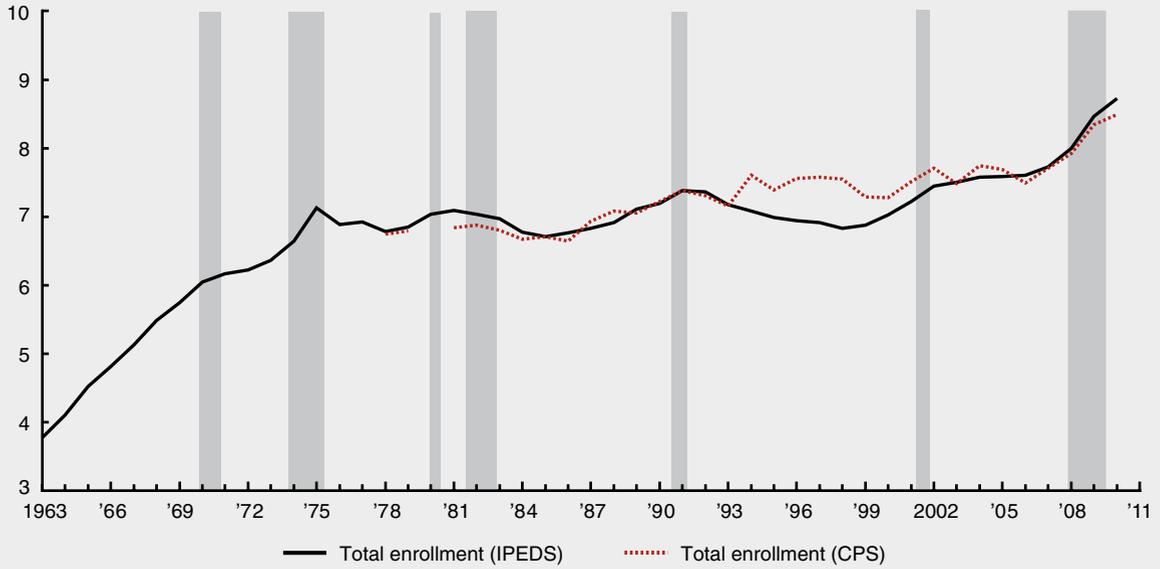
Looking at the long-term unemployment rate, we see that a 1 percentage point increase in the change in the long-term unemployment rate is associated with a 0.21 percentage point increase in the change in the total enrollment rate—this is nearly twice the size of the association between the total postsecondary enrollment rate and the overall unemployment rate and significantly different from zero at the 5 percent level. For all of our estimates in table 1, the association between the change in the long-term unemployment rate and the change in the enrollment rate is approximately

FIGURE 3

Postsecondary enrollment, IPEDS vs. CPS October Supplement

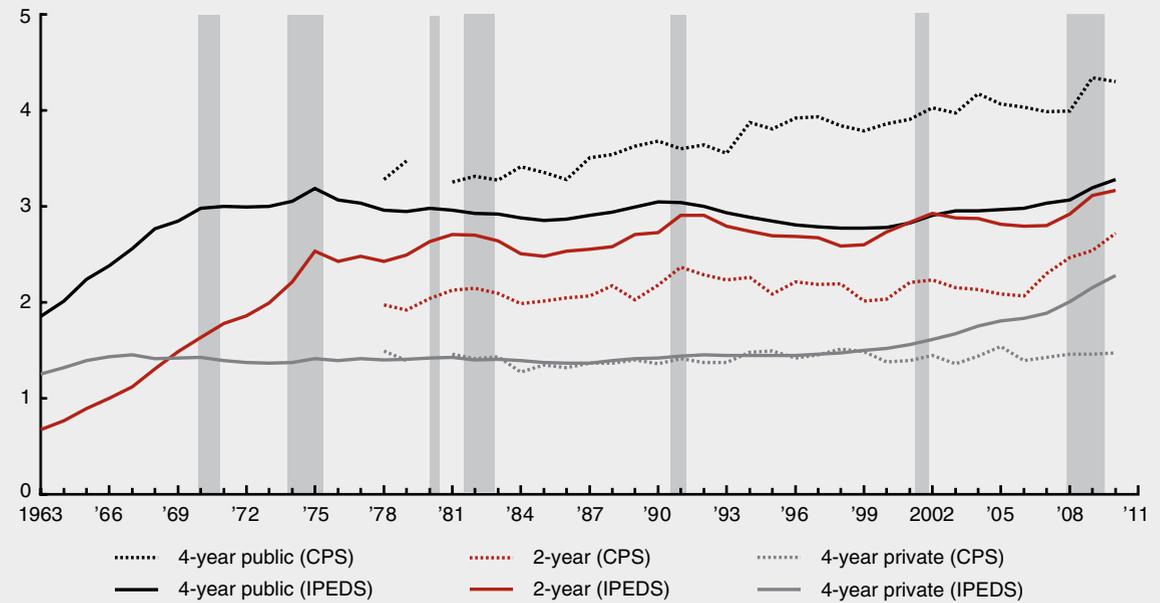
A. Total enrollment

percent of population 16 and over



B. Enrollment by institution type

percent



Note: Shaded bars indicate recessions as defined by the National Bureau of Economic Research.
Sources: Authors' calculations based on data from the National Center for Education Statistics' *Integrated Postsecondary Education Survey* (IPEDS) and the U.S. Bureau of Labor Statistics' *Current Population Survey* (CPS).

TABLE 1

Labor market conditions and postsecondary enrollment

	Δ Total	Δ Two-year	Δ Four-year public	Δ Four-year private
Δ Unemployment	0.108*** [0.032]	0.070*** [0.017]	0.030** [0.012]	0.008* [0.004]
R-squared	0.494	0.525	0.385	0.507
Δ Long-term unemployment	0.212** [0.090]	0.132** [0.053]	0.058* [0.031]	0.021* [0.011]
R-squared	0.259	0.271	0.229	0.494
Observations	33	33	33	33
Enrollment rate mean	7.100	2.678	2.931	1.490
Standard deviation of enrollment rate	0.280	0.147	0.095	0.142
Mean of outcome	0.033	0.018	-0.001	0.016
Standard deviation of outcome	0.145	0.094	0.049	0.025

Notes: Estimates are based on aggregate enrollment rates between 1975 and 2007. The outcome is the change in the percentage of the population enrolled in the type of postsecondary institution in the column title. Regressions also included a linear trend. Newey–West standard errors with one lag in brackets. Stars indicate probability values: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.
Sources: Authors' calculations based on data from the National Center for Education Statistics' *Integrated Postsecondary Education Survey* and Haver Analytics.

twice as large as when the association is measured using the change in the overall unemployment rate. To the extent that the unemployment and long-term unemployment rates move together, the difference in coefficient estimates reflects the differences in mean levels. Thus, in order to compare the results more directly, we consider the implied effect on the enrollment rate of a 1 standard deviation increase in the change in the regular or long-term unemployment rate. A 1 standard deviation increase in the change in the unemployment rate (0.95) is associated with a 0.10 percentage point increase in the change in the overall enrollment rate. In comparison, a 1 standard deviation increase in the change in the long-term unemployment rate (0.35) is associated with a somewhat smaller 0.07 percentage point increase in the change in the overall enrollment rate.

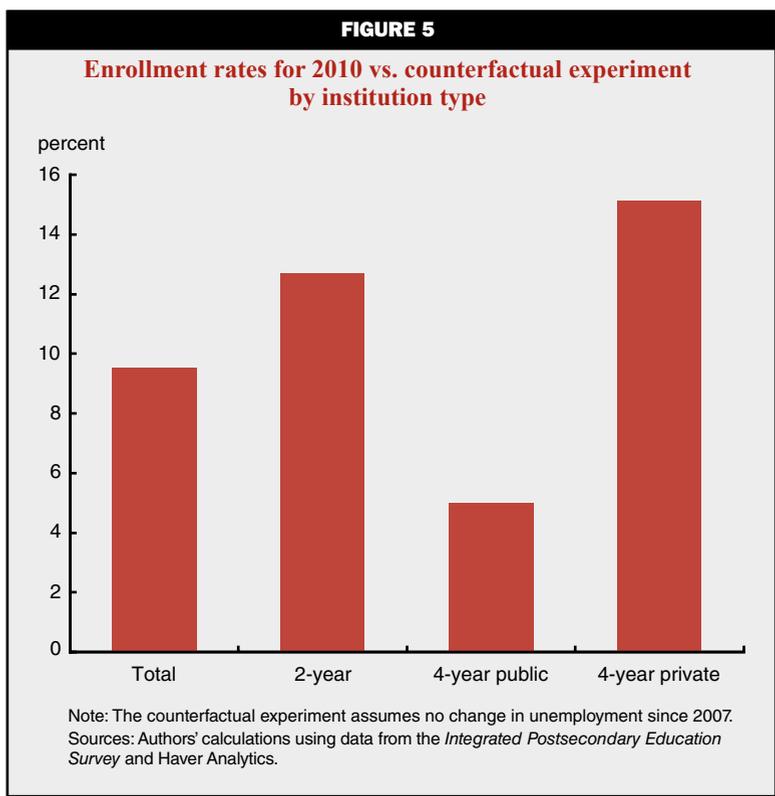
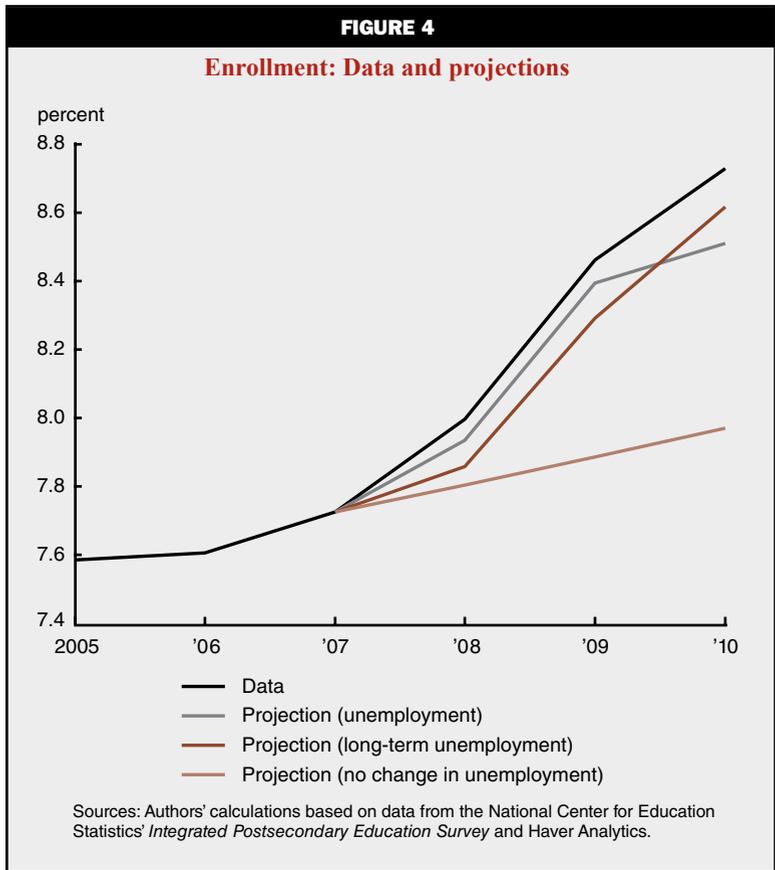
Columns 2, 3, and 4 of table 1 show the estimates when the outcome is the change in the two-year enrollment rate, the change in the four-year public enrollment rate, and the change in the four-year private enrollment rate, respectively. As shown in figure 2 (p. 119), changes in the two-year college enrollment rate are more closely associated with changes in the unemployment rate than changes in either the four-year public or four-year private enrollment rates. A 1 percentage point increase in the unemployment rate is associated with a 0.07 percentage

point (roughly 0.75 standard deviations) increase in the two-year college enrollment rate. Since the mean two-year enrollment rate in the sample was 2.678 percent, this implies a 2.6 percent increase in two-year enrollment. This is slightly lower than Betts and McFarland's (1995) preferred estimate of 4 percent, although they were considering full-time enrollment. A 1 percentage point increase in the unemployment rate is associated with a 0.03 percentage point (0.61 standard deviations) increase and a 0.008 percentage point (0.32 standard deviations) increase in the four-year public and private enrollment rates, respectively. Since total enrollment is the sum of two-year, four-year public, and four-year private enrollment, the coefficients from the separate regressions sum to the coefficients in column 1. This implies that approximately two-thirds of the association between unemployment and total enrollment can be

attributed to changes in two-year enrollment. Again, the estimates using the change in the long-term unemployment rate are nearly twice as large, 0.132 for the two-year enrollment rate and 0.058 for the four-year public enrollment rate. When converted to standard deviation units, however, the implied effects on enrollment rates are somewhat smaller than when we use the overall unemployment rate.

Enrollment in the Great Recession

So how did the change in enrollment during the Great Recession compare with what we would have expected based on previous recessions? Figure 4 plots the actual total enrollment rate; two forecasts of the total enrollment rate using our estimates from table 1 and the changes in the unemployment and long-term unemployment rates in 2008, 2009, and 2010; and a counterfactual forecast of enrollment that held the unemployment rate at its 2007 level. There are several things to note in figure 4. First, the 2010 total enrollment rate is 0.75 percentage points, or 9.5 percent, above where we would have expected it to be had the unemployment rate remained at 2007 levels. The total enrollment rate is also slightly above where we would have expected it to be, given the changes in the unemployment rate and the long-term unemployment rate. With that said, the observed change in the total enrollment



rate between 2007 and 2010 is quite close to the change predicted by observed changes in each of the two unemployment rates.

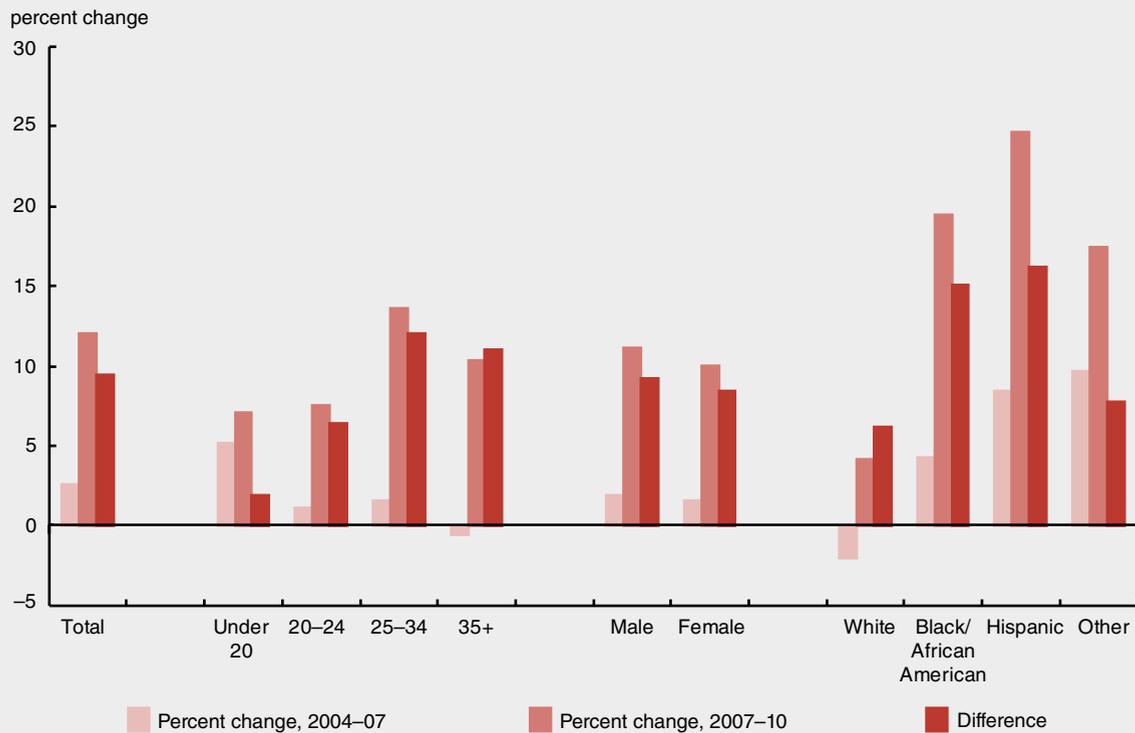
Figure 5 shows the gap by institution type between the 2010 enrollment rates and the counterfactual rates, which assume that the unemployment rate remained at its 2007 level. The “total” bar corresponds to the 9.5 percent gap shown in figure 4. The two-year enrollment rate is 12.7 percent higher, the four-year public enrollment rate is 5.0 percent higher, and the four-year private enrollment rate is 15.1 higher than we would have expected, given a constant 4.6 percent unemployment rate over this period.

One question of interest is whether particular demographic groups are driving the increase in enrollment. Ideally, we would estimate separate enrollment trends for each demographic group and decompose the 9.5 percent gap in total enrollment by the demographic groups. However, IPEDS enrollment data stratified by demographic characteristics are only available for recent years. As a result, we try to approximate the above exercise by decomposing the change in the overall enrollment rate into the changes in the contributions from demographic subgroups between 2007 and 2010, compared with the changes between 2004 and 2007.¹⁵ Figure 6 displays the changes in these components in percentage terms for different age groups, men, women, and different race categories.¹⁶ The overall enrollment rate grew by about 2.5 percent between 2004 and 2007, but it grew by roughly 12 percent between 2007 and 2010.

Looking first at the difference in the change in the enrollment rate contributions by age group, we see that all age subgroups contributed to the increase in the overall enrollment rate; however, the percentage

FIGURE 6

Change in total enrollment rates by demographic group



Note: Age group enrollment changes are calculated from 2005 to 2007 and 2007 to 2009 because of data availability.
 Source: Authors' calculations based on data from the National Center for Education Statistics' *Integrated Postsecondary Education Survey*.

changes among those over 24 years of age were larger than among the younger age groups.¹⁷ In particular, the change in the enrollment contribution for 25–35 year olds grew by 13.6 percent between 2007 and 2009, compared with 1.6 percent between 2005 and 2007, a net change of 12 percentage points. The net change for individuals 35 years old and over was similar, at 11 percentage points, while for the under 20s and 20 to 24 year olds, the net changes were 1.9 and 6.4 percentage points, respectively. Moving to the growth rates by gender, we see that the growth in enrollment for men was slightly larger than that for women. Finally, the growth rates by race/ethnicity groups show that there were increases in every group shown, but the largest increases were in the African American/black and Hispanic groups.

Cost-benefit analysis

Finally, we make a back-of-the-envelope estimate of the net benefit of this increased investment in education. We assume that the net tuition and fees for one

additional year of schooling are \$3,000.¹⁸ More importantly, we assume that an individual forgoes \$27,000 in earnings for each additional year of schooling. This is based on the average annual earnings of high school graduates who were 16 years and older and in the labor force in the 2010 March CPS. Thus, we assume that one year of schooling costs \$30,000. To the extent that those enrolling are less likely than the average labor force participant to be employed, this would be an overestimate of the costs; to the extent that those returning to school attended more expensive institutions on average, this would be an underestimate of the costs.¹⁹

On the benefits side, we assume one year of additional schooling permanently increases future earnings by 8.5 percent relative to the average earnings of a high school graduate. Jacobson, LaLonde, and Sullivan (2005) show that one year of community college increased the postdisplacement earnings of older displaced workers in Washington State by 7 percent for men and 10 percent for women. Given our somewhat broader sample, which includes young adults as well

TABLE 2

Costs and benefits

Scenario	Population	Increase in the change in the enrollment rate (percentage points)	Share of year	Cost	Lifetime benefit	Net benefit	Population benefit
2007 to 2010 vs. 2004 to 2007	243,826,000	0.85	0.60	\$18,000	\$19,570	\$1,570	\$3,271,338,206
Additional earnings		\$3,271,338,206					
Per additional enrolled person		\$1,570					
Per person		\$13					

Notes: We assume the population remains constant at its 2010 level. The cost measure assumes \$30,000 for one year's worth of credits (\$3,000 in tuition and fees and \$27,000 in forgone earnings) and that the average enrollee completes 60 percent of one year of schooling. The benefit estimate assumes an 8.5 percent increase in earnings for one year of courses, a 3.5 percent real interest rate, and 20 years of remaining work life. Sources: Authors' calculations based on data from the National Center for Education Statistics' *Integrated Postsecondary Education Survey*, the U.S. Bureau of Labor Statistics' *Current Population Survey*, and Haver Analytics.

as individuals enrolling in four-year colleges, we believe 8.5 percent should be a reasonable estimate of the average earnings increase. We transform this earnings increase into a lifetime benefit by assuming a 3.5 percent discount rate and 20 years of work life remaining for the average person in our sample.²⁰ Using these assumptions, the lifetime benefit of one additional year of college is \$32,617.

Unfortunately, we do not observe how much schooling individuals complete once they enroll. However, Jacobson, LaLonde, and Sullivan find that the average enrollee in their sample earned about 60 percent of one year's worth of credits. Therefore, we adjust the annual cost and benefit measures by 0.6.

The results from this exercise are shown in table 2. Between 2007 and 2010, the enrollment rate of the population increased by 0.85 percentage points relative to the increase in the enrollment rate observed between 2004 and 2007. We assume that the additional 0.85 percent of the population who enroll in school complete 0.6 years of schooling for a net benefit over their lifetime of \$1,570. The increase in the enrollment rate means that roughly an additional 2 million individuals enrolled in a postsecondary program, generating a population benefit of \$3.3 billion, or roughly \$13 per person over age 16.

CPS October Supplement

Many researchers have examined enrollment using the October Supplement of the *Current Population Survey* (for example, Card and Lemieux, 2001; Dallas and Sakellaris, 2003; and Mattila 1982). Although in principle we might expect the IPEDS and CPS data to be quite similar, as shown in figure 3, the series differ in their estimates of the overall enrollment rates during

the mid- to late 1990s and differ fairly substantially in their estimates of enrollment rates by level of institution. Next, we reestimate the previous results using enrollment rates from the October CPS data. These are presented in table 3.

While there is some evidence that the association between enrollment and the standard and long-term unemployment rates is positive, it is much weaker than the evidence provided by the IPEDS data. Overall, we find that a 1 percentage point increase in the change in the unemployment rate is associated with a 0.03 percentage point increase in the change in the enrollment rate, roughly one-third the size of the corresponding estimate using IPEDS data. In general, all estimates using CPS data are smaller than those using IPEDS data, with the relationship between changes in the unemployment rates and changes in four-year public enrollment rates becoming negative. Only the estimates for four-year private institutions (table 3, column 4) are roughly similar using either data source. Further, the only coefficient that remains significantly different from zero at a 5 percent level using the CPS data is the association between the change in the traditional unemployment rate and the change in two-year enrollment—0.053, which is 0.017 percentage points smaller than the analogous coefficient from the IPEDS estimates. If we focus only on the first column of table 3, where the estimates for the enrollment rate data in the CPS are quite similar to those for the IPEDS data, we would have concluded that enrollment during the Great Recession increased by much more than we would have predicted based on the pre-recession relationships between changes in the enrollment rate and changes in regular and long-term unemployment rates.

TABLE 3

Labor market conditions and postsecondary enrollment

	Δ Total	Δ Two-year	Δ Four-year public	Δ Four-year private
Δ Unemployment	0.033 [0.037]	0.053** [0.020]	-0.024 [0.023]	0.010 [0.020]
R-squared	0.021	0.159	0.072	0.035
Δ Long-term unemployment	0.053 [0.091]	0.081 [0.057]	-0.039 [0.050]	0.026 [0.048]
R-squared	0.009	0.059	0.057	0.036
Observations	27	29	27	27
Mean of level	7.268	2.134	3.720	1.410
Standard deviation of level	0.351	0.106	0.265	0.060
Mean of outcome	0.034	0.011	0.034	-0.005
Standard deviation of outcome	0.180	0.106	0.112	0.071

Notes: Estimates are based on aggregate enrollment rates between 1975 and 2007. The outcome is the change in the percentage of the population enrolled in the type of postsecondary institution in the column title. Regressions also included a linear trend. Heteroskedasticity-consistent standard errors in brackets. We could not use Newey–West standard errors because of a discontinuity in the data. Stars indicate probability values: *** indicates $p < 0.01$, ** indicates $p < 0.05$, and * indicates $p < 0.1$.
Source: Authors' calculations based on data from the October Supplement to the U.S. Bureau of Labor Statistics' *Current Population Survey*.

However, one advantage of the CPS data over the IPEDS data is that it provides a much richer set of individual characteristics, allowing for a more comprehensive analysis of changes in enrollment rates by subgroups. For example, in table 4, we use the CPS's total postsecondary enrollment data stratified by labor market status to decompose the 0.73 percentage point increase in total enrollment from 2007 to 2010 (as measured by the October CPS) into two components for each subgroup: the contribution from the change in the share of the population in each labor force status category (not in the labor force, employed, unemployed, and long-term unemployed), holding the enrollment rates in these categories fixed; and the contribution from the change in the enrollment rates within each category, holding the share of the population in each category fixed.²¹

Columns 1 and 3 of table 4 show the percentage of the population that was not in the labor force, employed, unemployed (for 26 weeks or less), or long-term unemployed (27 weeks or longer) in 2007 and 2010, respectively. These columns show that the share of the population that was employed decreased by over 4 percentage points between 2007 and 2010, whereas the population shares in all the other categories increased. Columns 2 and 4 show the total postsecondary enrollment rates for each of these labor market status categories in 2007 and 2010, respectively. In 2007, the enrollment

rate was highest among those not in the labor force (8.40 percent) and lowest among the long-term unemployed (4.69 percent). By 2010, the enrollment rate in each of these categories had increased, with the highest enrollment rate being among the regular unemployed (11.71 percent) and the lowest among the employed (7.41 percent).

Column 5 shows how total enrollment would have changed if the distribution of the population across the labor market categories had changed from the 2007 distribution to the 2010 distribution, but the 2007 enrollment rates had remained constant for each category. The contribution to the total change is positive for the categories whose share increased and negative for the employed category. The bottom row totals all of the contributions in column 5, and shows that the total enrollment rate would have fallen

by 0.02 percentage points had the distribution of the population across labor market categories changed as they did, with enrollment rates constant at their 2007 levels.

In column 6 of table 4, we present the contribution to the change in the enrollment rate coming from the change in the enrollment rates within labor force status category, holding constant the share of the population in each category. Since the enrollment rate increased within each category, all of the contributions are positive. Again, the bottom row totals the contributions, indicating that total enrollment would have increased by 0.75 percentage points had enrollment rates within labor force status categories changed as observed, but the distribution of the population across categories had remained constant. Together, the results in columns 5 and 6 suggest that the change in the total enrollment rate is driven by the increases in enrollment rates within categories, rather than changes in the distribution of the population across categories.

Conclusion

In this article, we examine how postsecondary enrollment changed during the Great Recession and how this change compared with the experience of earlier recessionary periods. We show that there have been large increases in two-year, four-year public, and four-year private enrollment since the start of the

TABLE 4

Decomposition of change in total postsecondary enrollment

Duration category	2007		2010		Decompositions		
	Population share (1)	Enroll rate (2)	Population share (3)	Enroll rate (4)	Due to increased durations and unemployment (5)	Due to increased enrollment (6)	Contribution to total change (7)
Not in labor force	33.73	8.40	35.36	9.56	0.14	0.41	0.55
Employed	63.3	7.18	58.78	7.41	-0.32	0.14	-0.19
Unemployed less than or equal to 26 weeks	2.42	7.89	3.33	11.71	0.07	0.13	0.20
Unemployed more than 26 weeks	0.56	4.69	2.53	7.58	0.09	0.07	0.17
Total	100	7.60	100	8.32	-0.02	0.75	0.73

Source: Authors' calculations using data from the October Supplement of the U.S. Bureau of Labor Statistics' Current Population Survey.

Great Recession, although these increases are only slightly larger than we would have expected based on the historical relationships between unemployment and enrollment. However, the increase in enrollment is significantly larger than we would have expected if the unemployment rate had remained at 2007 levels. We find suggestive evidence that enrollment increases were similar among men and women but that enrollment rates for older adults, African American/black individuals, and Hispanic individuals increased more quickly during the Great Recession relative to their pre-recession trends than enrollment rates for younger individuals, whites, and people of other races and ethnicities. Overall, we estimate that roughly 2.1 million more people enrolled in postsecondary education between 2007 and 2010 than we would have expected based on the change in the enrollment rate between 2004 and 2007. We find that this increase is a result of increases in the enrollment rates within labor force status groups rather than shifts in the population across groups. Using a simple cost-benefit analysis, we estimate that these individuals may experience an average net lifetime benefit of \$1,500 each, or roughly an additional \$3.3 billion overall.

NOTES

¹Authors' calculations using data from Haver Analytics.

²Davis and von Wachter (2011) look at the earnings losses of workers with three or more years of tenure who lost their job during a mass layoff event (30 percent or more of a firm's employees displaced).

³Based on Aud et al. (2012), indicator 49-2011.

⁴While changes in state appropriations for public education may lead to increases in direct costs during some recessionary periods, the College Board estimates that average net tuition and fees fell between 2006–07 and 2011–12 due in part to large increases in Pell grants and the American Opportunity Tax Credit, which was enacted as part of the American Recovery and Reinvestment Act (Baum and Ma, 2011).

⁵Current dollars, based on authors' calculations using the March Supplement to the U.S. Bureau of Labor Statistics' *Current Population Survey*.

⁶Both the population and labor market data were accessed via Haver Analytics.

⁷We combine private and public two-year postsecondary institutions into a single category because so few students are enrolled in two-year private, degree-granting institutions. In fall 2009, nearly 95 percent of all students enrolled in two-year colleges were enrolled at a public institution. See Snyder and Dillow (2012), table 196.

⁸The number of for-profit four-year institutions roughly doubled between fall 2000 and fall 2009, while the number of not-for-profit, four-year institutions declined slightly (Snyder and Dillow, 2012, table 5). Enrollment at not-for-profit four-year private institutions grew at an average annual rate of 2.3 percent between 2000 and 2010, compared with enrollment growth of 19.9 percent per year on average at for-profit four-year private institutions (authors' calculations, based on Snyder and Dillow, 2012, table 205.) Enrollment at the University of Phoenix's online campus alone grew from nearly 15,000 students in 2000 to 308,000 in 2010 (Snyder and Dillow, 2012, table 250).

⁹This will overstate the true enrollment rate of persons 16 years and older to the extent that some students are enrolled in more than one institution and/or some students may be younger than 16.

¹⁰The CPS October Supplement is a nationally representative survey that asks respondents detailed questions about their school enrollment.

¹¹While the opening of the gap in 1994 could be related to the major redesign of the CPS, we are not aware of an explanation for why the enrollment rates would become more similar again in the early 2000s.

¹²We do not include data prior to 1975 because we do not want to model the changes in federal financial aid that were likely an important factor in the increase in enrollment in the 1960s and early 1970s. Including this period, however, does not have a meaningful effect on our estimates.

¹³The key results are robust to excluding the time trend, using a quadratic time trend, or controlling for the share of the population aged 16 to 24. We have also tried including both the contemporaneous and lagged changes in the unemployment rate measures. In this case, our total estimated effects are somewhat smaller but not statistically different from the estimates shown.

¹⁴Since approximately two-thirds of the adult population is in the labor force, a 1 percentage point increase in the unemployment rate equals a 0.66 percentage point increase in the adult population becoming unemployed. Therefore, our estimate suggests that the number of people enrolling in postsecondary institutions is about 16 percent of the additional increase in the number of people who are unemployed ($0.16 = 0.108/0.667$).

¹⁵In principle, the sum of the subgroup enrollment shares constructed in this way will equal the total enrollment rate; however, total enrollment rates implied by our demographic subgroup data differ somewhat from those based on published total enrollment numbers. Also, for the age group data, we compare the change from 2005 to 2007 to the change from 2007 to 2009 because of data limitations. Specifically, the 2010 enrollment data by age group reflect only 75 percent of the total enrollment reported in the IPEDS published tables; and in 2004, roughly 16 percent of the students are reported as age unknown, compared with less than 1 percent of students reported as age unknown in 2005, 2007, and 2009.

¹⁶The "other" race/ethnicity category includes students for whom race/ethnicity is unknown (6–8 percent of students depending on the year), nonresident aliens (roughly 3.4 percent of students), Asians, Native Hawaiians or other Pacific Islanders, American Indians, or Alaskan Natives. Between 2007 and 2010, race/ethnicity reporting to IPEDS changed from seven categories—Non-Resident Alien; Race and Ethnicity unknown; Black, non-Hispanic; American Indian/Alaskan Native; Asian/Pacific Islander; Hispanic; and White, non-Hispanic—to nine categories. In the new reporting system, race and ethnicity are reported using a "two-question format" in which the first question asks whether the respondent is Hispanic/Latino, and the second question asks non-Hispanic respondents to report one or more race categories from the following: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White.

¹⁷Based on the CPS October Supplement, the age distribution within each of these categories remained relatively flat in each of the three years, except the average age of the 35-and-over group increased by about one-third per year between each period. Given that we expect enrollment rates to decline with age, this only strengthens the result that the growth in their enrollment rate increased between 2007 and 2010.

¹⁸As noted earlier, average tuition and fees at two-year institutions was \$2,600 in 2008–09. Average tuition and fees at four-year public institutions was \$6,312 in 2008–09. (Aud et al., 2012, table 49-1.)

¹⁹Based on October CPS data shown in table 4, the enrollment rate was highest in 2010 among those unemployed fewer than 27 weeks.

²⁰The average age among respondents 16 years and over in the 2010 October CPS is 45.

²¹For comparison, the IPEDS data measure a 1 percentage point increase in the enrollment rate over the same period.

REFERENCES

- Aud, Susan, William Hussar, Frank Johnson, Grace Kena, Erin Roth, Eileen Manning, Xiaolei Wang, and Jijun Zhang**, 2012, *The Condition of Education 2012*, U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences, report, No. NCES 2012-045, Washington, DC, May, available at <http://nces.ed.gov/pubs2012/2012045.pdf>, accessed on August 20, 2012.
- Baum, Sandy, and Jennifer Ma**, 2011, *Trends in College Pricing*, College Board, Advocacy & Policy Center, report, New York, available at http://trends.collegeboard.org/downloads/College_Pricing_2011.pdf, accessed on August 20, 2012.
- Betts, Julian R., and Laurel L. McFarland**, 1995, "Safe port in a storm: The impact of labor market conditions on community college enrollments," *Journal of Human Resources*, Vol. 30, No. 4, Autumn, pp. 741–765.
- Card, David, and Thomas Lemieux**, 2001, "Drop-out and enrollment trends in the postwar period: What went wrong in the 1970s?," in *Risky Behavior Among Youths: An Economic Analysis*, Jonathan Gruber (ed.), Chicago: University of Chicago Press, pp. 439–482.
- Davis, Steven J., and Till M. von Wachter**, 2011, "Recessions and the cost of job loss," National Bureau of Economic Research, working paper, No. 17638, December.
- Dellas, Harris, and Plutarchos Sakellaris**, 2003, "On the cyclicity of schooling: theory and evidence," *Oxford Economic Papers*, Vol. 55, No. 1, January, pp. 148–172.
- Gustman, Alan L., and Thomas L. Steinmeier**, 1981, "The impact of wages and unemployment on youth enrollment and labor supply," *Review of Economics and Statistics*, Vol. 63, No. 4, November, pp. 553–560.
- Jacobson, Louis, Robert J. LaLonde, and Daniel Sullivan**, 2005, "The impact of community college retraining on older displaced workers: Should we teach old dogs new tricks?," *Industrial & Labor Relations Review*, Vol. 58, No. 3, April, pp. 398–415.
- Kahn, Lisa B.**, 2010, "The long-term labor market consequences of graduating from college in a bad economy," *Labour Economics*, Vol. 17, No. 2, April, pp. 303–316.
- Kalil, Ariel, and Kathleen M. Ziol-Guest**, 2008, "Parental employment circumstances and children's academic progress," *Social Science Research*, Vol. 37, No. 2, June, pp. 500–515.
- Mattila, J. Peter**, 1982, "Determinants of male school enrollments: A time-series analysis," *Review of Economics and Statistics*, Vol. 64, No. 2, May, pp. 242–251.
- Snyder, Thomas D., and Sally A. Dillow**, 2012, *Digest of Education Statistics 2011*, U.S. Department of Education, National Center for Education Statistics, Institute of Education Sciences, report, No. NCES 2012-001, Washington, DC, June.