



Munich Personal RePEc Archive

Just the Facts: Demographic and Cross-Country Dimensions of the Employment Slump

Clemens, Jeffrey and Wither, Michael

University of California at San Diego

26 November 2014

Online at <https://mpra.ub.uni-muenchen.de/60228/>
MPRA Paper No. 60228, posted 28 Nov 2014 06:52 UTC

Just the Facts: Demographic and Cross-Country Dimensions of the Employment Slump

Jeffrey Clemens and Michael Wither*

November 26, 2014

Abstract:

We present data characterizing the U.S. labor market during the Great Recession and subsequent recovery. U.S. employment declines were dramatic among young adults, substantial among prime-aged adults, and modest among those near retirement. The decline in employment among working-age adults generally exceeded those that occurred in other advanced economies. We assess the potential explanatory power of population aging and increases in educational attainment as factors underlying these developments. Recent analyses suggest that population aging can explain nearly one half of the decline in the labor force participation rate and one third of the decline in the employment to population ratio from 2007 to 2013. Our comparisons of employment developments across age groups and countries provide reason to view this one third as an upper bound on aging's plausible contribution. We conduct a more detailed analysis of changes in employment and school attendance across demographic sub-groups of the young adult population. Across sub-groups defined by age, gender, and race/ethnicity, changes in school enrollment predict very little of the variation in this period's employment changes. Taken together, aging and enrollment trends thus appear to underlie a modest to moderate fraction of the aggregate employment decline. We conclude by discussing a range of non-demographic factors that may have contributed to the decline, but on which existing research has yet to arrive at a consensus.

*Clemens: University of California at San Diego, Jeffrey Clemens, Economics Department, 9500 Gilman Drive #0508, La Jolla, CA 92093-0508, USA. Telephone: 1-509-570-2690. E-mail: clemens.jeffrey@gmail.com.
Wither: University of California at San Diego. Email: mwither@ucsd.edu.

Labor market aggregates tell a consistent story regarding the magnitude of the employment declines that occurred during the Great Recession. Between July 2007 and July 2009, the all-adult employment to population ratio declined by nearly 5 percentage points. The unemployment rate rose by a similar amount. Crises in housing and financial markets had taken their toll on the U.S. labor market.

Subsequent labor market developments have proven more difficult to interpret. Between July 2009 and July 2013, the unemployment rate rebounded sufficiently to erase half of its prior increase. The employment to population ratio recovered little, however, as the unemployment rate's recovery involved significant labor force exit.

In this research note, we characterize the demographic and cross-country dimensions of this period's labor market developments. We proceed in the following steps. First, we graphically display the evolution of a set of standard labor market aggregates, namely the employment, unemployment, and labor force participation rates, for the full population of U.S. adults. Second, we separately present these aggregates for young adults, prime-aged adults, and the near elderly. Third, we place the U.S. employment experience into its international context. Finally, we explore the extent to which declines in employment among young adults have been associated with increases in school enrollment. Throughout, we consider the data's implications for the potential role of purely demographic forces as explanations for the sustained slump in U.S. employment.

We summarize our conclusions as follows. U.S. employment declines were dramatic among young adults, substantial among prime-aged adults, and generally larger than those that occurred in other advanced economies. Recent analyses attribute a 1.3 to 1.6 percentage point decline in the U.S. labor force participation rate to population aging (Council of Economic Advisers, 2014; Aaronson et al., 2014). These estimates point to aging as a cause of as much as one half of the decline in the labor force participation rate and one third of the overall employment decline. The data we present suggest that

these estimates likely represent an upper bound on aging's potential contribution to these developments.

Substantial declines in the employment of non-elderly adults highlights the necessity of looking beyond population aging. Aging can explain neither the 4 percentage point decline in the employment rate of prime-aged adults nor the 8 percentage point decline in young adult employment. The size of the U.S. employment slump relative to declines in European labor markets casts further doubt on the hypothesis that purely demographic trends are the primary source of recent developments.

While the substantial decline in young adult employment remains little understood, recent analyses point to trends in educational attainment as a potential, partial explanation (Council of Economic Advisers, 2014; Aaronson et al., 2014). We provide new evidence on the plausibility of the link between changes in participation, employment, and school enrollment by comparing changes across relatively narrow demographic groups. Across sub-groups of young adults categorized by age, gender, and race/ethnicity, there was essentially no correlation between this period's changes in rates of enrollment and either employment or labor force participation. Changes in enrollment *per se* thus appear unlikely to underlie any more than a very small fraction of the 8 percentage point decline in young adult employment.

1 Aggregate U.S. Labor Market Developments

The panels of figure 1 present the recent evolution of three broad labor market aggregates for all U.S. persons aged 15 and over. Panel A presents the employment to population ratio. Between July 2005 and July 2007, this ratio was relatively stable at 63 percent. Over the course of the Great Recession, it declined by nearly 5 percentage points to just over 58 percent. Between July 2009 and July 2013, the employment to pop-

ulation ratio recovered little. Over the subsequent year (not pictured), it recovered by 0.3 percentage point. This sustained, post-recession slump in the employment to population ratio compactly characterizes the labor market's sluggishness.

Panel B presents the evolution of the unemployment rate for all persons aged 15 and over. Like the employment to population ratio, the unemployment rate was relatively stable, at 5 percent, between July 2005 and July 2007. It then rose by roughly 5 percentage points, to 10 percent, between July 2007 and July 2009. Unlike the employment to population ratio, the unemployment rate has recovered non-trivially towards its pre-recession levels. Between July 2009 and July 2013, it steadily declined to just over 7 percentage points. Over the subsequent year (not pictured) it declined by an additional percentage point.

Panel C presents the evolution of the labor force participation rate for all persons aged 15 and over. Like the previous two series, the labor force participation rate was relatively stable between July 2005 and July 2007, edging down slightly over the interval's latter months. Unlike the previous series, labor force participation evolved relatively smoothly over the course of the Great Recession and subsequent recovery. From July 2009 through July 2013 the labor force participation rate declined steadily from 66 percent to 63 percent. This 3 percentage point decline, coupled with the unemployment rate's partial recovery, underlie the employment to population ratio's sustained decline of more than 4 percentage points. Like the unemployment rate, labor force participation declined by nearly a full percentage point over the subsequent year (i.e., from July 2013 to July 2014).

2 Employment Trends across Age Groups

We further characterize U.S. labor market developments by separately examining employment trends among young adults (aged 15 to 24), prime-aged adults (aged 25 to 54), and near elderly adults (aged 55 to 64). We organize the data as follows. Figure 2 presents the evolution of the employment to population ratio, with separate panels for all working-age adults, young adults, prime-aged adults, and the near elderly. Figure 3 similarly presents the evolution of the unemployment rate, while figure 4 presents the evolution of the labor force participation rate.

2.1 The Facts

Figure 2 reveals that the employment rate declined rather dramatically for young adults, significantly for prime-aged adults, and essentially not at all for the near elderly. As shown in Panel A, the employment rate for all working-age adults declined by roughly 5 percentage points, from 72 to 67, between July 2005 and July 2013. Panel B reveals a larger decline, of roughly 8 percentage points, for young adults aged 15 to 24. The decline for young adults began earlier than the all-adult decline, as it fell from 54 percentage points to 52 percentage points between April 2007 and July 2007. Within this age group, for which summer employment is common, the 2007 summer hiring season appears to have been quite poor. Panel C reveals that the employment rate of prime-aged adults declined by 4 percentage points, from just under 80 percent to just under 76 percent, between July 2007 and July 2009. Between July 2009 and July 2013 it recovered by less than 1 percentage point. Following an arc of decline and recovery, the employment rate of adults aged 55 to 64 stood at 61 percent in July 2013. This was precisely the level at which it stood in July 2005.

Figure 3 shows that the unemployment rate followed broadly similar patterns across

age groups. For each group, the unemployment rate exhibited a significant increase during the Great Recession. Subsequent recoveries had, in each instance, erased roughly half of these losses by July 2013. While the patterns are similar, the magnitudes of these changes vary significantly across age groups. The initial increase in the unemployment rate was roughly 8 percentage points among young adults, 5 percentage points among prime-aged adults, and 3.5 percentage points among the near elderly.

Figure 4 reveals that labor force participation followed quite different paths across age groups. For the full population of working-age adults, the labor force participation rate steadily declined to 73 percent from just under 76 percent. The decline for young adults aged 15 to 24 was relatively large and relatively sharp. Between July 2006 and July 2009, their labor force participation rate declined by 6 percentage points. It had not recovered as of July 2013. Among prime-aged adults, the labor force participation rate decline gradually from 83 percent to 81 percent. Most of this group's decline occurred during the post-recession period. By contrast, the near elderly's labor force participation rate increased from 63 percent to just over 64 during this period.

2.2 Questions of Interpretation

We consider these data in light of recent analyses by the Council of Economic Advisers (2014), Aaronson et al. (2014), and Hall (2014). An important clarifying distinction between these studies involves the aggregates on which they focus. The Council of Economic Advisers (2014) and Aaronson et al. (2014) decompose the causes of declines in the labor force participation rate. Hall (2014), by contrast, decomposes the gap between actual and potential GDP into contributions from declines in labor force participation, increases in involuntary unemployment, and several additional factors.

The Council of Economic Advisers (2014) and Aaronson et al. (2014) estimate that population aging underlies a decline of between 1.3 and 1.6 percentage points in the

labor force participation rate for all persons aged 15 and above. Both analyses emphasize a substantive difficulty associated with estimating the link between population aging and labor force participation. Such estimates require constructing a counterfactual pattern of retirements associated with a population in which the age-profile did not change. The difficulty lies in constructing this counterfactual.

The method adopted for the Council of Economic Advisers's (2014) baseline estimate assumes that, over the course of the recession and recovery, age-specific retirement decisions would hold constant at their 2007 rates. This approach assumes a continuation of the retirement patterns associated with peaks in both housing and financial wealth. Because actual retirements occurred at lower rates, due in part to contracting wealth, it likely assigns to aging an overly generous share of the total decline.

The baseline estimate of Aaronson et al. (2014) incorporates changes in age-specific retirement patterns over the course of the crisis. They conclude that aging underlies a 1.3 percentage point decline in the all-adult participation rate. This estimate appears broadly consistent with the dimensions of the data we present. Its assumptions are also open to debate, however. For example, late-recession retirement rates may, in part, reflect involuntary late-career job loss rather than planned labor force exit. Consequently, this method may also overstate population aging's contribution.

Aaronson et al.'s (2014) estimate leaves a labor force participation decline of just under 2 percentage points to be explained by factors beyond population aging. As previously displayed, 2 percentage points was roughly the size of the decline in the labor force participation rate of prime-aged adults (i.e., those aged 25 to 54).¹ Aaronson et al.'s (2014) estimate is thus consistent with what one would infer by simply using the decline among prime-aged adults to approximate the extent to which labor force exit

¹Recall that the labor force participation rate of young adults aged 15 to 24 had fallen by an even more substantial 6 percentage points.

cannot be explained by aging into retirement.

We close this section by placing population aging's effects into the broader context of the overall decline in employment. A 1.3 percentage point decline in labor force participation can account for 30 percent of the 4.3 percentage point decline in the employment rate for all persons aged 15 and over from July 2007 through July 2013. Our reading of the aggregate data matches with Hall's (2014) assessment that, as of 2013, labor force exit and elevated unemployment rates had both contributed substantially to the shortfall of U.S. output relative to trend. Here again, it is useful to look to the labor market experience of prime-aged adults, which cannot plausibly be attributed to aging. This group's employment rate declined by a substantial 4 percentage points, while even younger adults' employment rate fell by 8 percentage points. Factors other than aging thus appear likely to underlie most of the recent U.S. experience.

3 The International Experience

Figures 5 and 6 place the U.S. employment experience into its international context. Figure 5 displays changes in the employment to population ratio for working-age adults in 21 advanced economies, as well as the average change across the Organization for Economic Cooperation and Development (OECD).² The international experience exhibits remarkable variation. Employment changes between July 2005 and July 2013 range from an 11 percentage point decline in Greece to an 8 percentage point increase in Germany.³

For the full working-age population, U.S. employment declined substantially by international standards. On average across the OECD, employment declined by less than 1 percentage point. The decline experienced in the United States was larger than that in

²All data come from the Federal Reserve Economic Data (FRED) database.

³For more on the German experience, see Burda and Hunt (2011) and Hoffmann and Lemieux (2014).

all countries presented outside of Greece, Spain, Ireland, and Portugal. Relative to the United States, employment in a number of advanced economies proved considerably more robust.⁴

Figure 6 presents cross-country data on changes in the employment of young and prime-aged adults. Declines for prime-aged adults are displayed on the x-axis and declines for young adults on the y-axis. The U.S. changes in employment emerge once again as being relatively large and negative. Outside of the experiences of Greece, Spain, Ireland, and Portugal, the U.S. lies near the bottom of both distributions.

We draw two lessons from these cross-country data. First, the dramatic variation across countries is of interest in its own right and in need of further study. Even excluding the experiences of Greece, Spain, Ireland, and Portugal, significant variation remains. The fiscal, social, and individual-level economic implications of population-wide employment shifts of several percentage points are sure to be substantial. Second, the cross-country experience sheds additional light on the plausibility of purely demographic explanations for the U.S. employment slump. To the extent to which comparison countries have experienced demographic transitions similar to those at work in the United States, the cross-country experience casts doubt on explanations rooted primarily in such phenomena.

4 Young Adult Employment and School Enrollment

Panel B of figure 2 revealed the decline of young adult employment to be a particularly striking 8 percentage points. Both Aaronson et al. (2014) and the Council of Economic Advisers (2014) discuss the possibility that trends in educational attainment

⁴In an analysis emphasizing trends in construction employment, Hoffmann and Lemieux (2014) present the evolution of aggregate unemployment rates across a subset of these countries. Unemployment rates similarly show the U.S. experience to have been worse than that of countries including Canada and Germany and better than that of Italy and Spain.

would ultimately have resulted in much lower young adult employment rates in the Great Recession's absence. Over the time period in question, the school enrollment rate of young adults increased by a substantial 3.5 percentage points. As emphasized by Aaronson et al. (2014), however, many enrolled young adults are employed. Conversely, non-trivial numbers of unenrolled young adults are unemployed. Holding the employment of the enrolled and unenrolled constant, Aaronson et al. (2014) estimate that the increase in enrollment can explain a 1.25 percent point decline in young adults' labor force participation.⁵

In figures 7 through 10 we explore the potential relevance of enrollment increases by examining the relationship between enrollment and employment changes across demographic sub-groups. Figures 7 and 8 present the full time paths of enrollment and employment for relatively broad sub-groups of the young adult population. Figures 9 and 10 present the relationship between employment and enrollment changes across relatively narrow sub-groups.

Figure 7 presents the evolution of enrollment, labor force participation, and employment separately for male and female young adults aged 16 to 24. The enrollment rates of both genders increased significantly over this period. For males it rose from 45 percent in 2005 to 48 percent in 2012. For females it rose from 49 percent to 53 percent. While female enrollment rose slightly more than male enrollment, employment declines were larger for males than for females. Over this time period, the young adult male labor force participation rate declined from 63 percent to 57 percent; for females it declined from 58 percent to 54 percent. As of July 2013, the young adult male employment rate remained down by 10 percentage points from its pre-recession levels. The female employment rate

⁵Aaronson et al. (2014) observe that a portion of the decline in participation among enrollees may reflect an increase in educational intensity on the intensive margin. They note that such changes in the labor supply of high school enrollees, in particular, would be consistent with shifting patterns of time use documented by Ramey and Ramey (2010).

remained down by a smaller but still substantial 7 percentage points.

Figure 8 characterizes the evolution of enrollment, labor force participation, and employment separately for black and white teenagers.⁶ Differences in the paths of these groups' enrollment and employment rates are striking. From 2005 to 2012, white teenagers experienced essential no change in school enrollment, which held steady at just under 80 percent. By contrast, black teenage enrollments increased from just over 72 percent in 2005 to 81 percent in 2011, then declined to 77 percent in 2012. Changes in employment followed the opposite pattern. White teen employment declined by roughly 12 percentage points between 2005 and 2013, while black teen employment declined by 5 percentage points. These groups' labor force participation rates decline by 10 and 4 percentage points respectively. Relative changes in enrollment and labor force participation rates were thus positively, rather than negatively, correlated.

Figures 9 and 10 show that the absence of a negative correlation between changes in enrollment and employment was systematic over this time period. The figures present changes in enrollment and employment rates for 72 age-by-gender-by-race/ethnicity demographic cells ($9 \times 2 \times 4$). We calculated changes from a base of 2005-2007 through an end period of 2011-2013.

Changes in enrollment and labor force participation rates were modestly *positively* correlated across these 72 demographic cells. Inspection of the scatter plot reveals this positive correlation to be driven in large part by black and Hispanic females. Changes in both the enrollment and labor force participation of black and Hispanic females (in particular those aged 20 or 21) were significantly above the averages across other groups. Figure 10 reveals a similar pattern for employment, though declines in employment

⁶Figures 7 and 8 are based directly on data downloadable through the FRED database. This restricts us to plotting the employment of teenage blacks and whites rather than all young adult blacks and whites. In figures 9 and 10 we turn to data from the American Community Survey, in which we are at liberty to construct series on whatever demographic bases we desire. In the latter figures, comparisons across genders and racial and ethnic groups are thus made on a more similar basis.

among young Hispanic males were sufficient to make the overall correlation between enrollment and employment changes modestly negative. Employment declines were particularly large among Hispanic and white male teenagers, while employment was relatively robust among Hispanic females aged 21 to 24.

The absence of an economically meaningful correlation between changes in employment and enrollment rates casts doubt on enrollment trends as an underlying cause of employment declines. Further, we note that the presence of a negative correlation would not, by itself, answer policy-relevant questions regarding the underlying mechanisms. The choice between enrollment and work should respond to the *relative* returns of these activities. Substitution of schooling for work could be viewed as a positive development if it reflects absolute improvements in the opportunities made possible by advanced degrees. If the underlying forces have eroded the opportunities available to those with no post-secondary education, however, concern may be the more appropriate response.⁷

5 Conclusion

U.S. labor markets have recovered much more slowly and less completely from the Great Recession than one might have hoped. The sustained employment decline was particularly pronounced among young adults. As shown above, changes in school enrollment across sub-groups of the young-adult population predict very little of the variation in this period's employment changes. Factors other than trends towards higher enrollment rates thus appear to be at work. The decline in the employment rate of prime-aged adults was also quite large by both historical and international standards.

⁷Work by Autor et al. (2008) suggests that labor market developments may be pushing relative returns from both sides, as high skilled workers have seen opportunities rise while demand for lower skilled workers may have declined or stagnated. Autor et al. (2013) emphasize that declining opportunities are particularly relevant for those whose job tasks are readily substituted for by technology, trade, or immigration.

As emphasized above, explanations for employment declines among both young and prime-aged adults necessarily involve forces other than population aging. We conclude by discussing additional factors that may have contributed to these declines. While most of these factors have received at least some attention in recent research, consensus has not been reached regarding their relative importance.

A variety of non-demographic explanations for the U.S. employment slump have been advanced. We divide them into two broad categories and briefly note their potential policy implications. Our first broad category includes macroeconomic factors associated with business cycles. DeLong and Summers (2012), for example, emphasize the potential role of “hysteresis” effects through which a severe downturn may have sustained, negative impacts on an economy’s performance. To the extent to which such forces are at work, stimulus-oriented policies may be an appropriate response. Baker et al. (2013) present evidence that the Great Recession was coupled with sustained, elevated levels of policy uncertainty, which other work has linked directly to macroeconomic performance (Bloom, 2009; Shoag and Veuger, 2014). From a policy perspective, the “solution” to such uncertainties may simply be to cease with uncertainty generating policy making.⁸

A second category of policy-relevant explanations includes factors associated with the opportunities and incentives facing workers and their prospective employers. Mulligan, for example, has emphasized the incentive effects associated with the Affordable Care Act (Mulligan, 2014) and the expansion of safety-net spending more generally (Mulligan, 2012). Hall (2014) similarly discusses sustained expansions in food stamp spending and disability receipt. Hagedorn et al. (2013) argue for a substantial role for extended unemployment insurance benefits, while Rothstein (2011) and Farber and Valletta (2013) argue the opposite. Also potentially relevant, in particular for the employment of young adults, were this period’s substantial minimum wage increases. If such policies have

⁸This is, of course, much easier said than done.

significantly reduced employment, a re-evaluation of the tradeoffs associated with the more distortionary among them, whichever they may be, may prove salutary.

The aforementioned research addresses a variety of potentially relevant explanations for employment's sluggish recovery from the Great Recession. At the same time, linkages between various explanations, and in particular between social insurance programs and macroeconomic developments, are less fully understood. A great deal of policy uncertainty, for example, has arisen in the context of the Affordable Care Act's implementation. By the same token, minimum wage increases may be particularly likely to reduce employment during cyclical downturns. Finally, issues of long-run unemployment, hysteresis, and the rise of disability receipt have natural interrelationships.⁹ A fuller understanding of these linkages may be important for determining what constitute reasonable policy responses to the labor market's post-recession condition.

⁹See, for example, Autor and Duggan's (2003) analysis of linkages between trends in inequality, the evolution of disability insurance replacement rates, and labor force exit among low-skilled workers.

References

- Aaronson, Stephanie, Tomaz Cajner, Bruce Fallick, Felix Galbis-Reig, Christopher L Smith, and William Wascher**, "Labor Force Participation: Recent Developments and Future Prospects," Technical Report 2014-64, Federal Reserve Board of Cleveland 2014.
- Autor, David H and Mark G Duggan**, "The rise in the disability rolls and the decline in unemployment," *The Quarterly Journal of Economics*, 2003, pp. 157–205.
- Autor, David H., David Dorn, and Gordon H. Hanson**, "Untangling Trade and Technology: Evidence from Local Labor Markets," *NBER Working Paper 18938*, 2013, (18938).
- Autor, David H, Lawrence F Katz, and Melissa S Kearney**, "Trends in US wage inequality: Revising the revisionists," *The Review of Economics and Statistics*, 2008, 90 (2), 300–323.
- Baker, Scott R, Nicholas Bloom, and Steven J Davis**, "Measuring Economic Policy Uncertainty," Technical Report 2013.
- Bloom, Nicholas**, "The Impact of Uncertainty Shocks," *Econometrica*, 2009, 77 (3), 623–685.
- Burda, Michael C and Jennifer Hunt**, "What explains the German labor market miracle in the Great Recession?," *NBER Working Paper 17187*, 2011.
- Council of Economic Advisers**, "The Labor Force Participation Rate Since 2007: Causes and Policy Implications," Technical Report, Executive Office of the President 2014.
- DeLong, J Bradford and Lawrence H Summers**, "Fiscal Policy in a Depressed Economy," *Brookings Papers on Economic Activity*, 2012, pp. 233–297.

Farber, Henry S and Robert Valletta, "Extended unemployment insurance and unemployment duration in the Great Recession: The US experience," *FRBSF Working Paper 2013-09*, 2013.

Hagedorn, Marcus, Fatih Karahan, Iourii Manovskii, and Kurt Mitman, "Unemployment benefits and unemployment in the great recession: the role of macro effects," *NBER Working Paper 19499*, 2013.

Hall, Robert E, "Quantifying the Lasting Harm to the US Economy from the Financial Crisis," in "NBER Macroeconomics Annual 2014, Volume 29," University of Chicago Press, 2014.

Hoffmann, Florian and Thomas Lemieux, "Unemployment in the Great Recession: A Comparison of Germany, Canada and the United States," *NBER Working Paper 20694*, 2014.

Mulligan, Casey B, "Do welfare policies matter for labor market aggregates? Quantifying safety net work incentives since 2007," *NBER Working Paper 18088*, 2012.

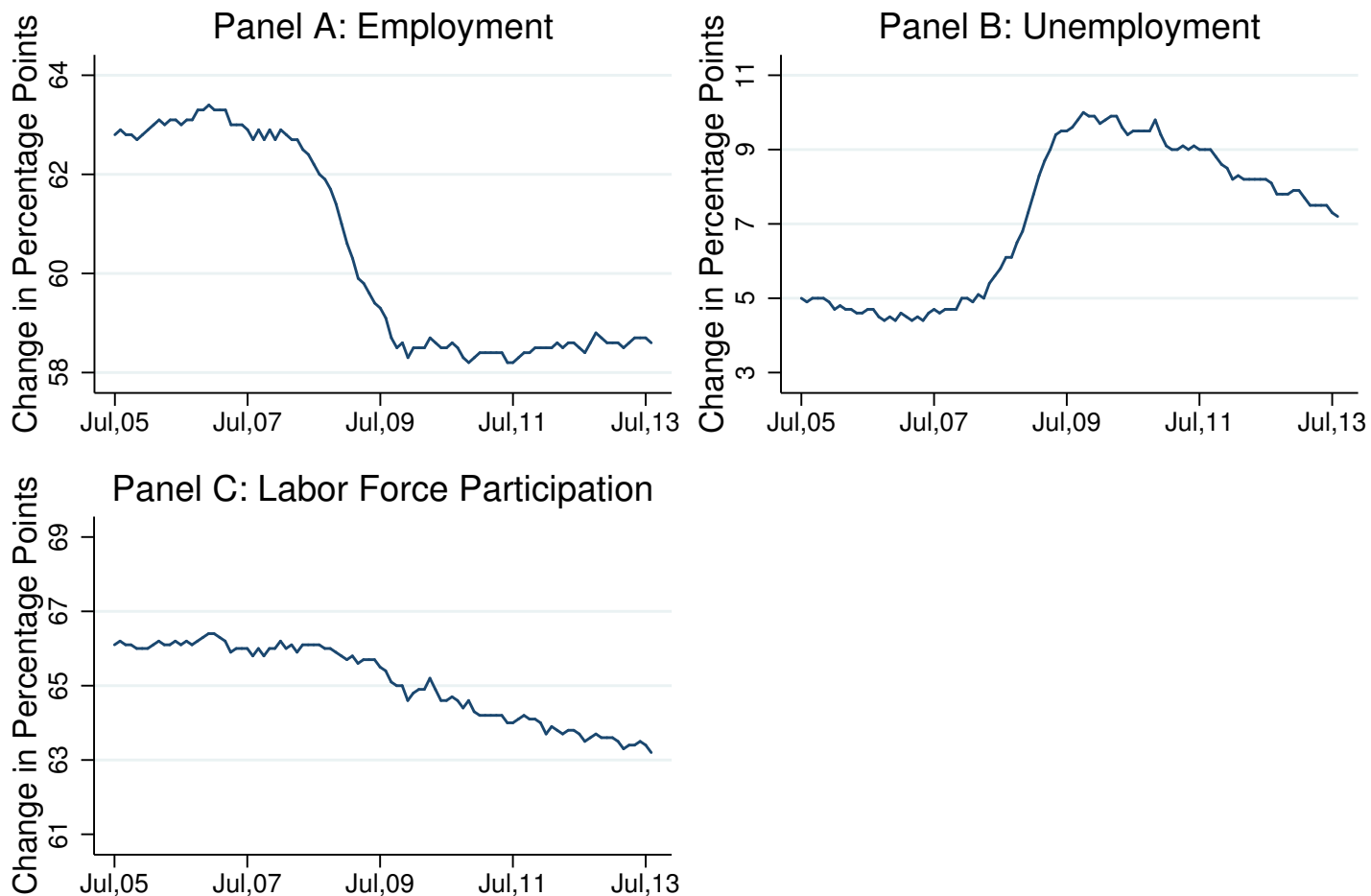
—, "The ACA: Some Unpleasant Welfare Arithmetic," *NBER Working Paper 20020*, 2014.

Ramey, Garey and Valerie A Ramey, "The Rug Rat Race Comments and Discussion," *Brookings Papers on Economic Activity*, 2010, pp. 129–176.

Rothstein, Jesse, "Unemployment insurance and job search in the Great Recession," *NBER Working Paper 17534*, 2011.

Shoag, Daniel and Stan Veuger, "Uncertainty and the Geography of the Great Recession," *AEI Economics Working Paper 2013-05*, 2014.

United States Adult Population (15+)

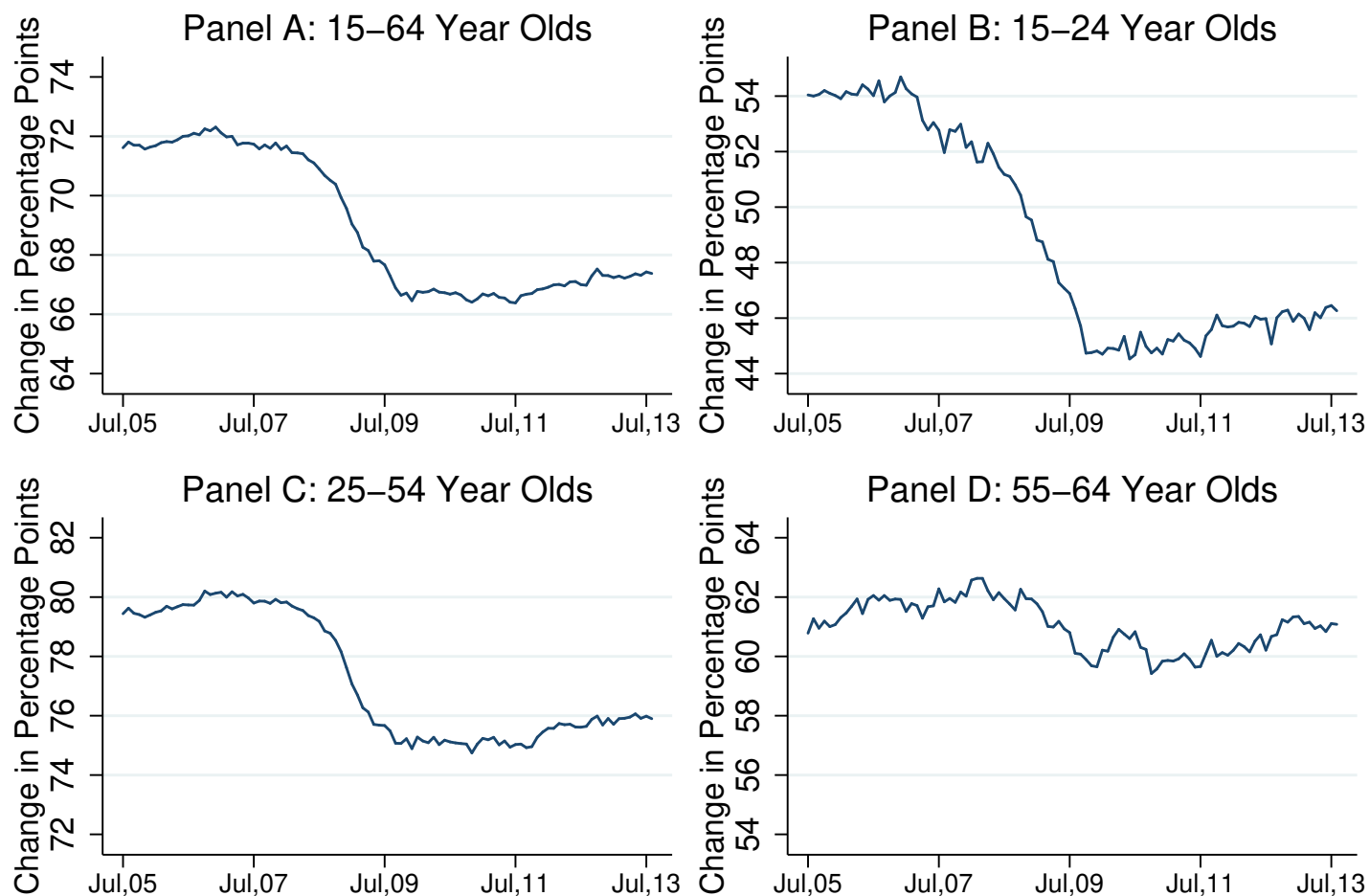


17

Figure 1: The Evolution of U.S. Labor Market Aggregates Over the Great Recession’s Course

This figure’s panels plot the monthly employment rate, unemployment rate, and labor force participation rate for all persons aged 15 and over in the United States from July 2005 through July 2013. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LREMTTUSM156S, LRUN25TTUSM156S, and LRACTTUSM156S.

Employment Rate: United States

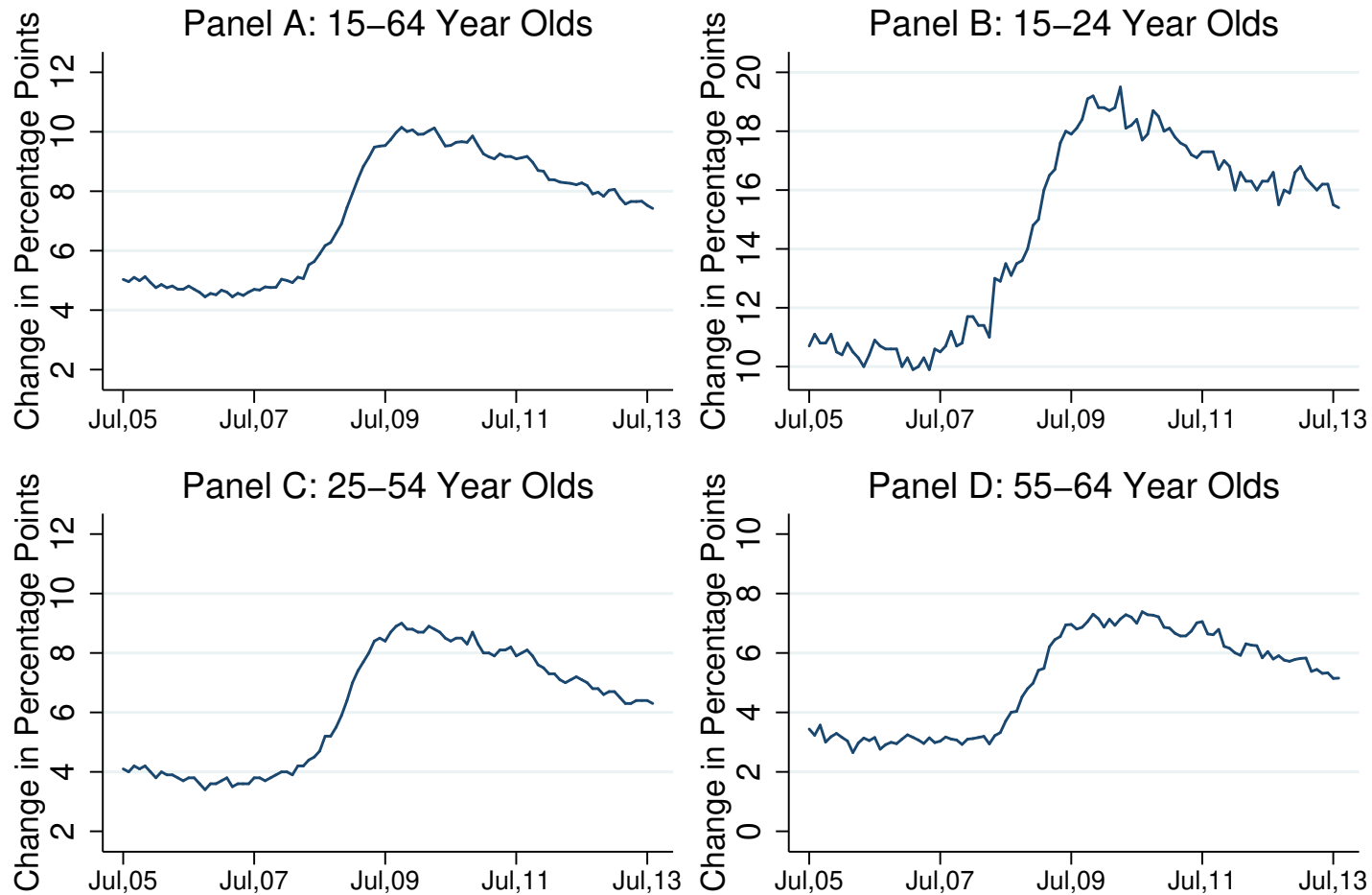


81

Figure 2: The Evolution of U.S. Employment to Population Ratios by Age Group

This figure's panels display the monthly employment rate for all persons aged 15-64, 15-24, 25-54, and 55-64 in the United States from July 2005 through July 2013. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LREM64TTUSM156S, LREM24TTUSM156S, LREM25TTUSM156S, and LREM55TTUSM156S.

Unemployment Rate: United States



61

Figure 3: The Evolution of U.S. Unemployment Rates by Age Group

This figure's panels display the monthly unemployment rate for all persons aged 15-64, 15-24, 25-54, and 55-64 in the United States from July 2005 through July 2013. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LRUN64TTUSM156S, LRUN24TTUSM156S, LRUN25TTUSM156S, and LRUN55TTUSM156S.

Labor Force Participation Rate: United States

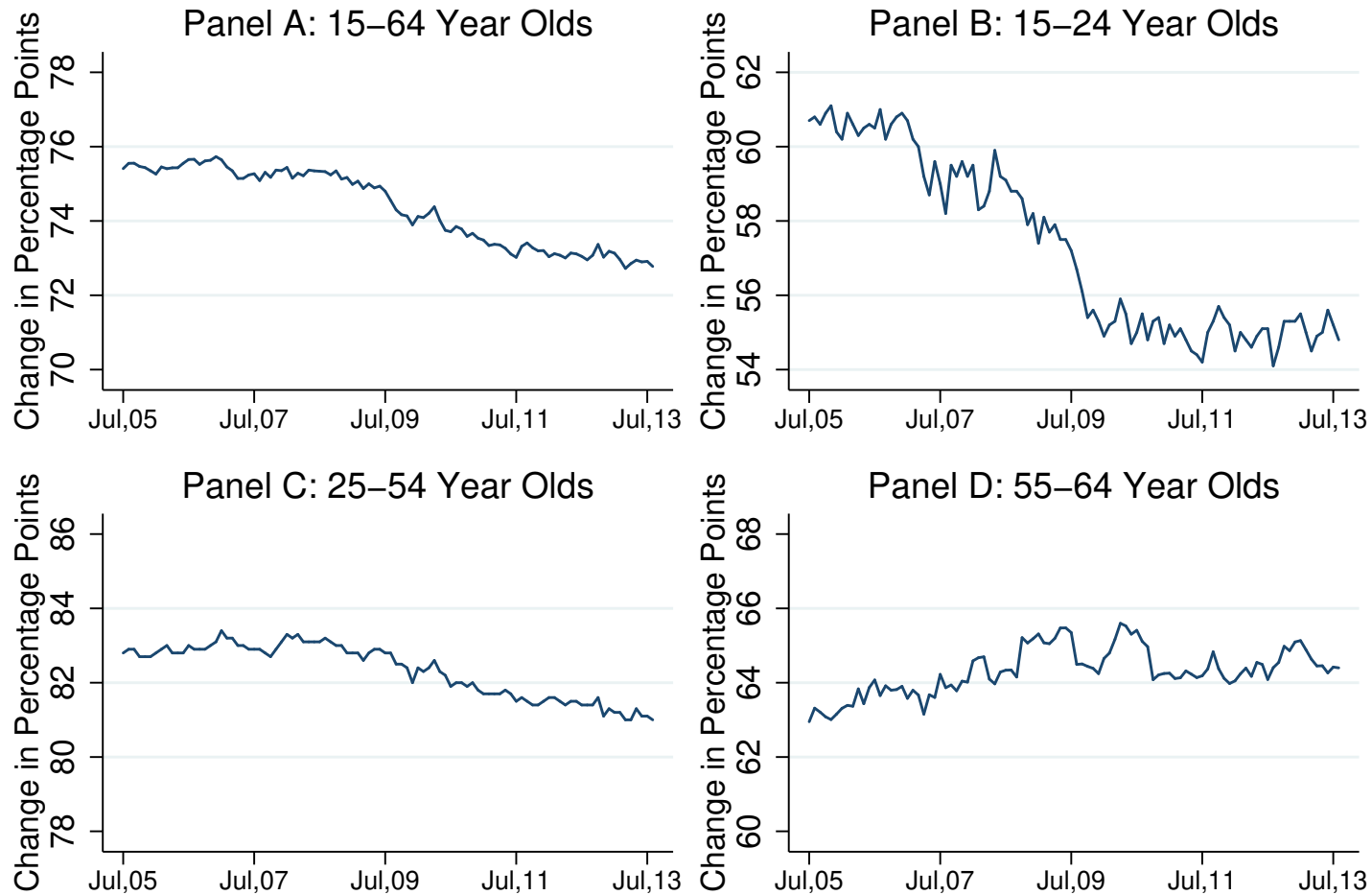


Figure 4: The Evolution of U.S. Labor Force Participation Rates by Age Group

This figure's panels display the monthly labor force participation rate for all persons aged 15-64, 15-24, 25-54, and 55-64 in the United States from July 2005 through July 2013. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LRAC64TTUSM156S, LRAC24TTUSM156S, LRAC25TTUSM156S, and LRAC55TTUSM156S.

Employment Rate Changes from 2005–2013: 15–64 Year Olds

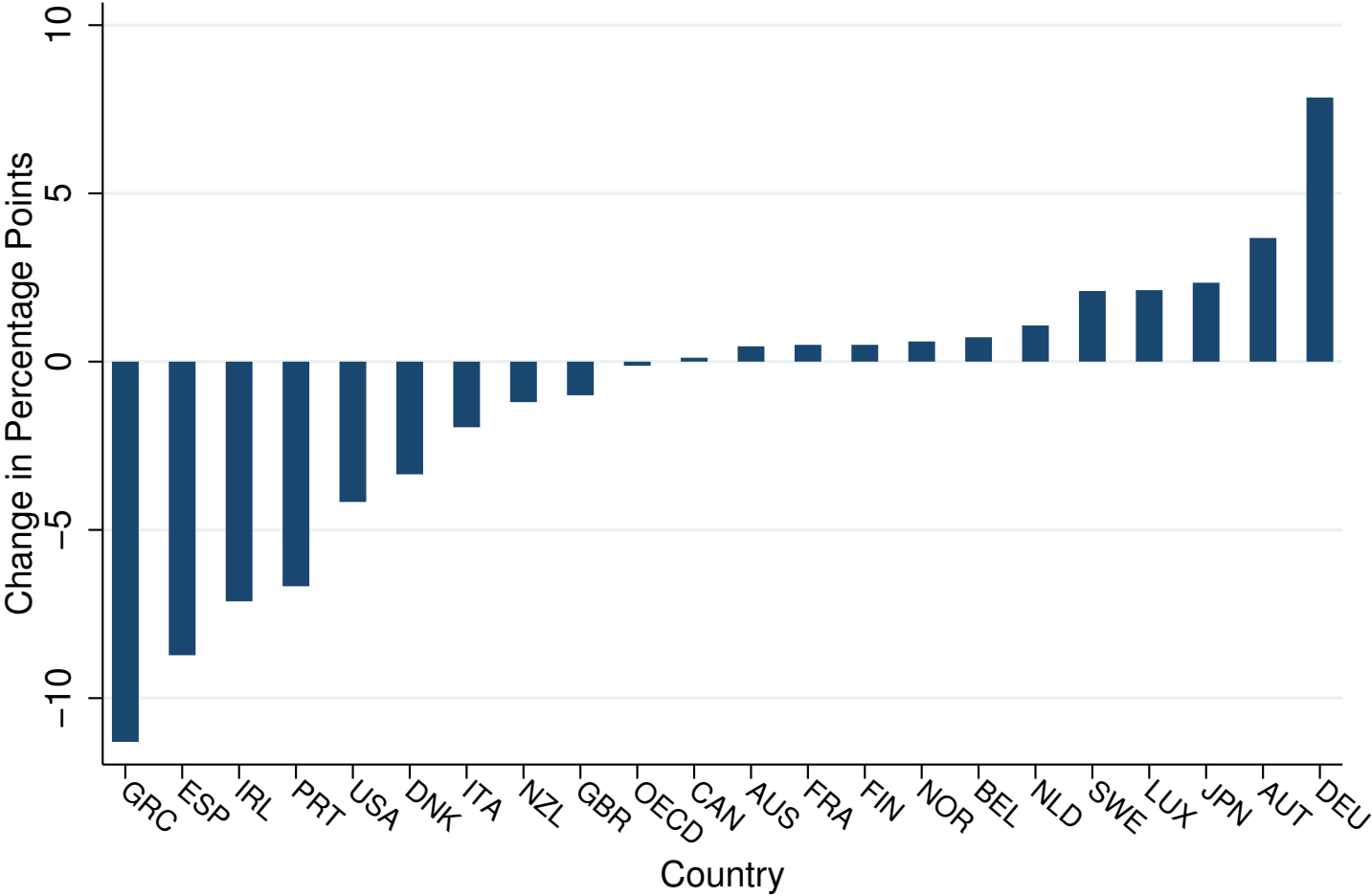


Figure 5: Changes in the Employment Rates of Working Age Adults across Countries

This figure displays the change in the annual employment rate from 2005 to 2013 for all persons aged 15-64 across various countries. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LREM64TTAUA156S, LREM64TTATA156N, LREM64TTBEA156N, LREM64TTCAA156N, LREM64TTDEA156N, LREM64TTDKA156N, LREM64TTESA156N, LREM64TTFIA156N, LREM64TTFRA156N, LREM64TTGBA156S, LREM64TTGRA156S, LREM64TTIEA156N, LREM64TTITA156N, LREM64TTJPA156S, LREM64TTLUA156N, LREM64TTNLA156N, LREM64TTNOA156N, LREM64TTNZA156N, LREM64TTO1A156N, LREM64TTPTA156N, LREM64TTSEA156N, and LREM64TTUSA156S.

Employment Rate Changes from 2005–2013: 15–24 And 25–54 Year Olds



Figure 6: Cross-Country Employment Changes: Young Adults vs. Prime Aged Adults

This figure displays each country's change in its annual employment rate from 2005 to 2013 for all persons aged 15-24 against the equivalent change for all persons aged 25-54. All data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LREM24TTAUA156N, LREM24TTATA156S, LREM24TTBEA156N, LREM24TTCAA156N, LREM24TTDEA156N, LREM24TTDKA156N, LREM24TTESA156N, LREM24TTFIA156N, LREM24TTFRA156N, LREM24TTGBA156N, LREM24TTGRA156N, LREM24TTIEA156S, LREM24TTITA156N, LREM24TTJPA156N, LREM24TTLUA156N, LREM24TTNLA156N, LREM24TTNOA156S, LREM24TTNZA156S, LREM24TTO1A156N, LREM24TTPTA156N, LREM24TTSEA156N, LREM24TTUSA156N, LREM25TTAUA156N, LREM25TTATA156N, LREM25TTBEA156S, LREM25TTCAA156N, LREM25TTDEA156S, LREM25TTDKA156N, LREM25TTESA156N, LREM25TTFIA156N, LREM25TTFRA156N, LREM25TTGBA156N, LREM25TTGRA156N, LREM25TTIEA156N, LREM25TTITA156N, LREM25TTJPA156S, LREM25TTLUA156S, LREM25TTNLA156N, LREM25TTNOA156N, LREM25TTNZA156N, LREM25TTO1A156N, LREM25TTPTA156N, LREM25TTSEA156N, and LREM25TTUSA156S.

Young Adult Employment, Labor Force Participation, and School Enrollment by Gender

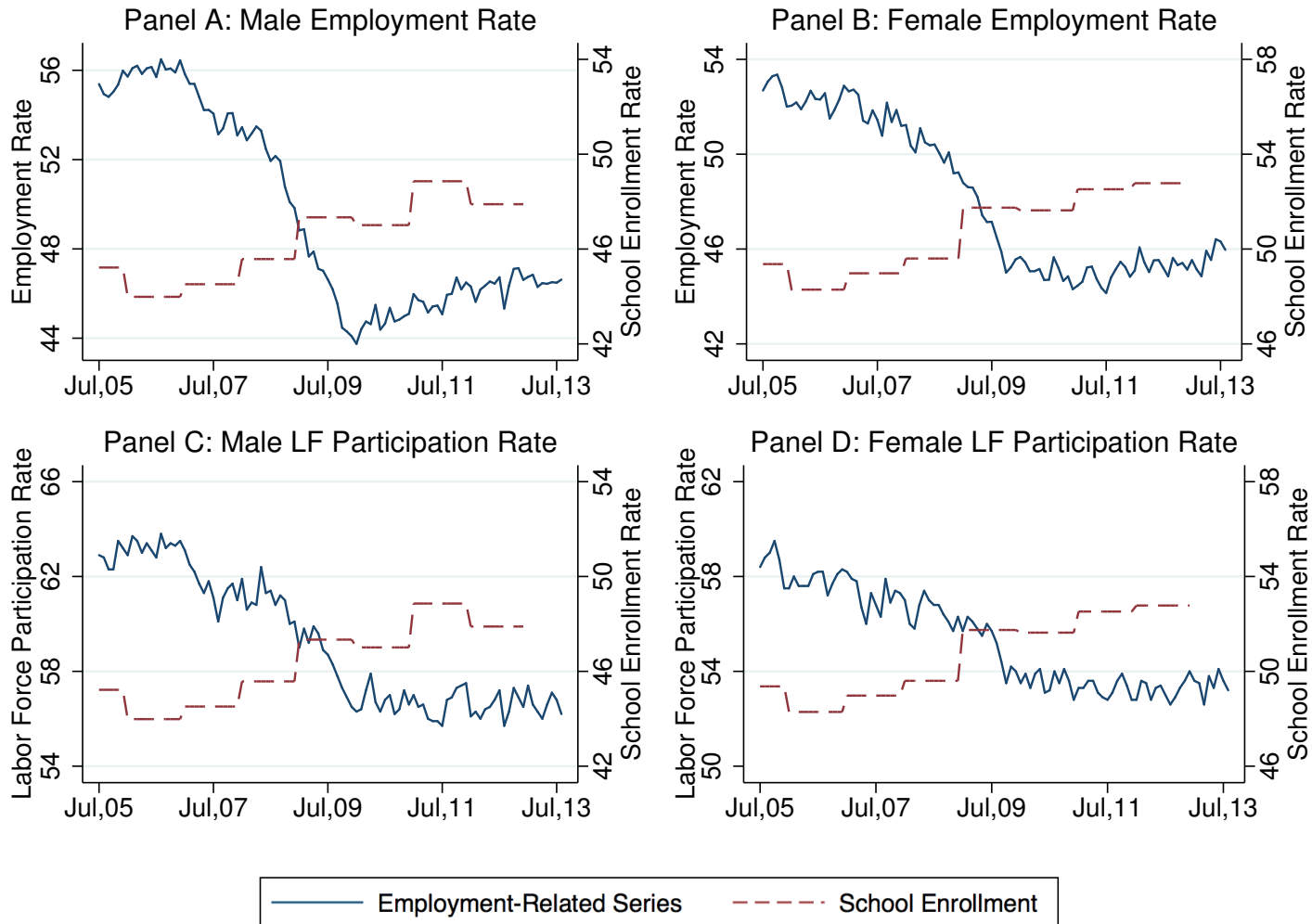


Figure 7: The Evolution of U.S. Young Adult Employment, Labor Force Participation, and School Enrollment by Gender

This figure's panels display employment-related and school enrollment rates by gender for all persons aged 15-24 years old in the United States from July 2005 through July 2013. Each panel's title describes the specific employment-related outcome for the relevant gender in the panel. All employment related data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LREM24MAUSM156S, LREM24FEUSM156S, LRAC24MAUSM156S, and LRAC24FEUSM156S. The school enrollment percentages were obtained from the relevant series of the National Center for Education Statistics's (NCES) Digest of Education Statistics.

Teenager Employment, Labor Force Participation, and School Enrollment by Race

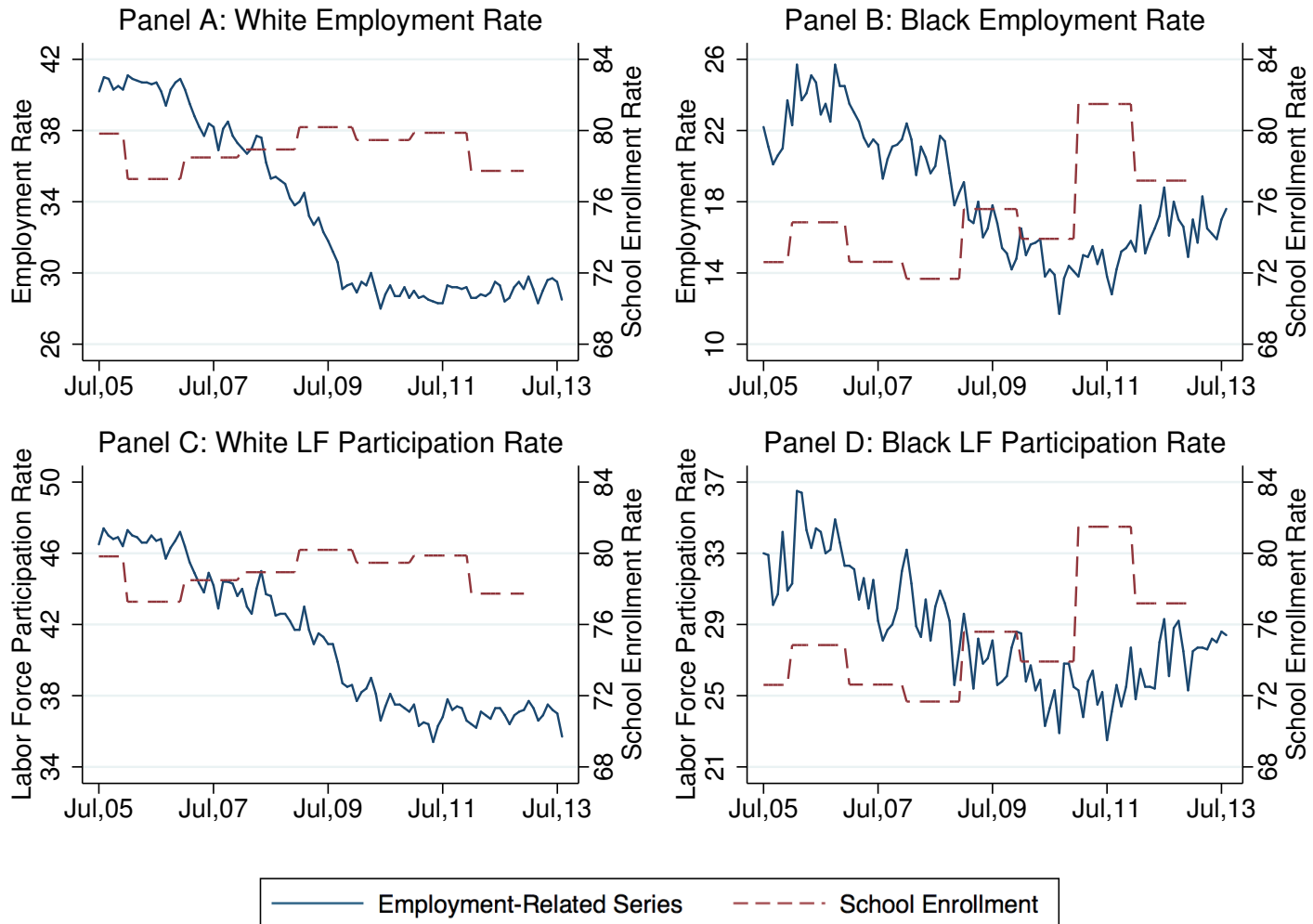


Figure 8: The Evolution of U.S. Teenager Employment, Labor Force Participation, and School Enrollment by Race

This figure's panels display employment-related and school enrollment rates by race for all persons aged 16-19 years old in the United States from July 2005 through July 2013. Each panel's title describes the specific employment-related outcome for the relevant race in the panel. All employment related data were obtained from the St. Louis Federal Reserve Economic Data (FRED) database. The FRED Series IDs used in constructing the figure include: LNS12300015, LNS12300018, LNS11300015, LNS11300018. The school enrollment percentages were obtained from the relevant series of the National Center for Education Statistics's (NCES) Digest of Education Statistics.

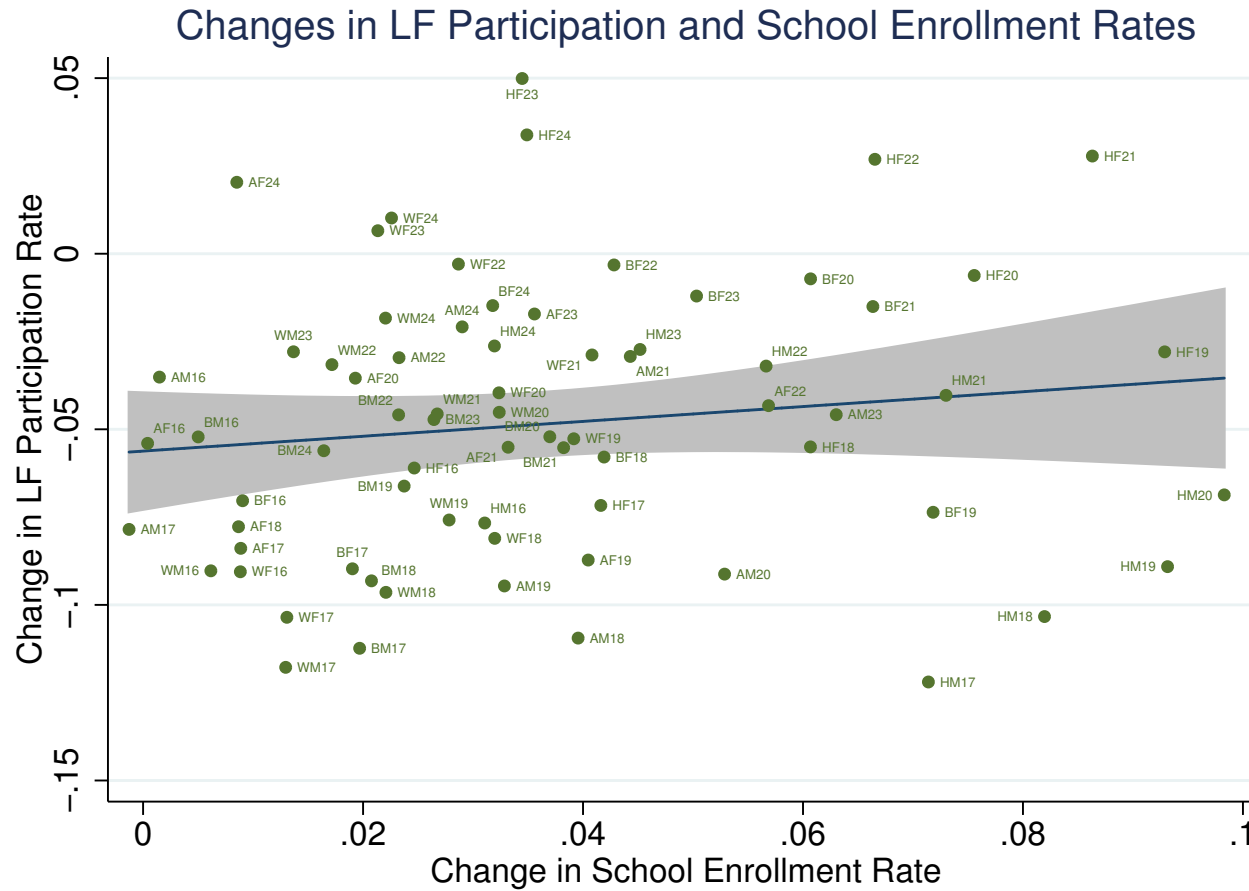


Figure 9: Race, Gender, and Age Specific Changes in School Enrollment and Labor Force Participation Rates

This figure displays the change in school enrollment and labor force participation rates across demographic groups. The changes are constructed using a base period extending from 2005-2007 and a subsequent period extending from 2011-2013. The data points are associated with 72 gender (female and male) by race/ethnicity (Asian, black, Hispanic and white) by age (individual groups for ages 16 through 24) demographic cells. Each label identifies the race/ethnicity (first letter), gender (second letter), and age of the respective group. All of the relevant employment and school enrollment rates were tabulated by the authors using data from the U.S. Census Bureau's 2005 to 2012 American Community Surveys (ACS).

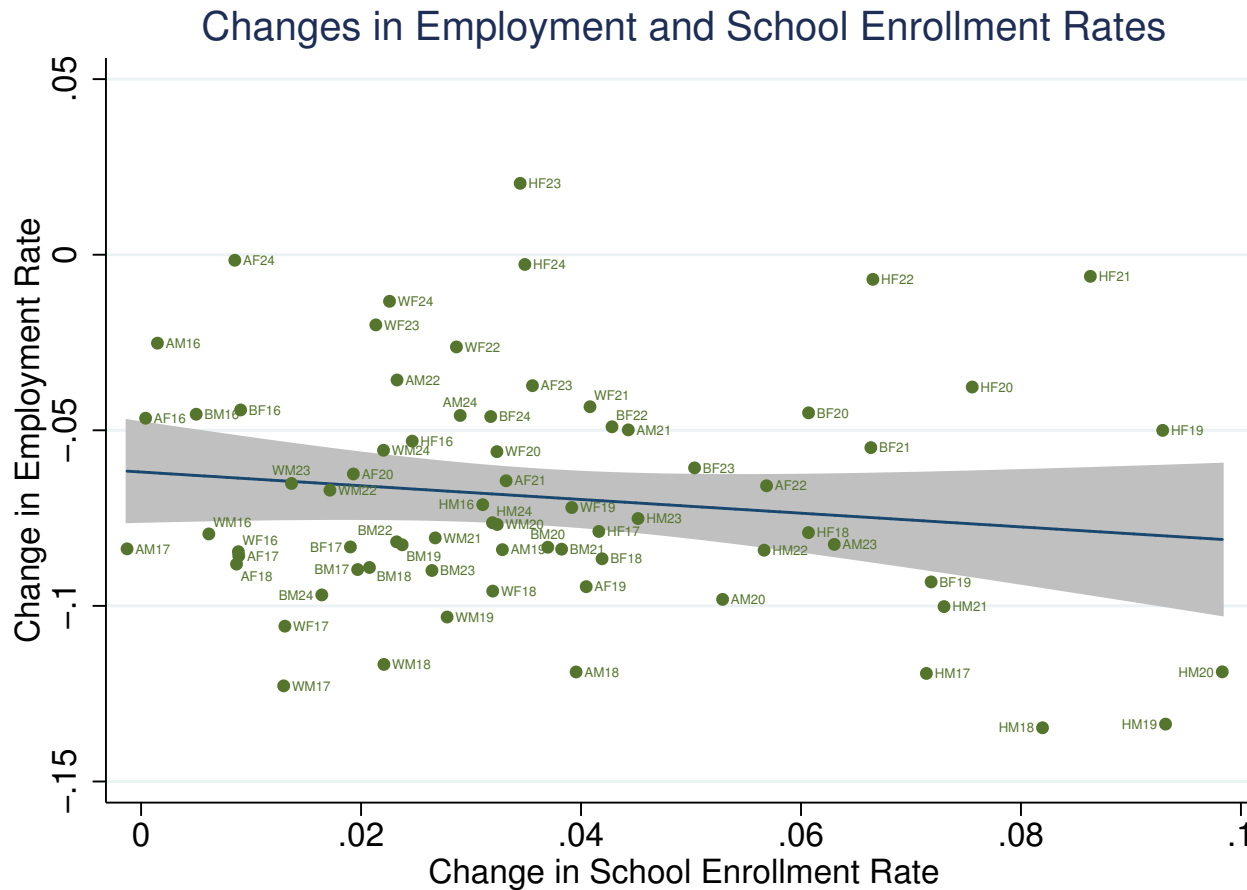


Figure 10: Race, Gender, and Age Specific Changes in School Enrollment and Employment Rates

This figure displays the change in school enrollment and employment rates across demographic groups. The changes are constructed using a base period extending from 2005-2007 and a subsequent period extending from 2011-2013. The data points are associated with 72 gender (female and male) by race/ethnicity (Asian, black, Hispanic and white) by age (individual groups for ages 16 through 24) demographic cells. Each label identifies the race/ethnicity (first letter), gender (second letter), and age of the respective group. All of the relevant employment and school enrollment rates were tabulated by the authors using data from the U.S. Census Bureau's 2005 to 2012 American Community Surveys (ACS).