

Public Policy 713

Causal Inference in Education Policy Research II:

Postsecondary

Winter 2020 M/W: 10-11:20am

Weill Hall 1220

Professor Susan Dynarski

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Sign up for office hours:

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[Bluejeans link for office hours](#)

Course Objectives

This course explores methods for causal inference in research on postsecondary education. The focus is on topics relevant to education policy, including student aid, debt, college-match quality, attainment, and the labor-market returns to schooling.

Prerequisites

The course assumes mastery of regression analysis, including fixed effects and limited dependent variables. The course is part of a two-part sequence with Public Policy 712; mastery of the content of that course is also assumed, including randomized trials, matching, and panel data methods. Facility with a statistical programming language is also assumed.

Course Requirements and Grading

Data Analysis Exercises (3) 30%

You will work singly or with up to two classmates; groups will submit a single product. Problem sets are due on February 5, March 9, and April 6.

Take home final 30%

A take-home final will be due the day of the final exam, which is scheduled for April 27th.

Reading Questions 30%

We will post questions about some of the readings, which you will complete before class.

Class Participation 10%

Readings

You are expected to complete the assigned reading before class. There will typically be one or two articles assigned for each class. You must read these closely in order to understand what is going on. Read actively: circle what is unclear, highlight what you find most interesting, peruse the bibliography for useful sources, read the footnotes and tables especially closely. It is very useful to write a summary of the paper for your own files.

Course Material

There is no course packet. All articles are available online or on the CANVAS site. Assignments will be listed under the relevant lecture. We provide links and/or PDFs but you are ultimately responsible for obtaining the readings. If a link is broken or a file corrupted please find the article yourself.

Below is a list of useful references. As needed, we may assign chapters to supplement discussion articles.

Murnane, R., & Willett, J. (2010). *Methods matter: improving causal inference in educational and social science research*. New York, NY: Oxford University Press, USA.

Angrist, J., & Pischke, J. (2009). *Mostly harmless econometrics: An empiricist's companion*. Princeton, NJ: Princeton University Press.

Angrist, J., & Pischke, J. (2015). *Mastering 'Metrics: The Path from Cause to Effect*. Princeton, NJ: Princeton University Press.

Laptop Policy/Taking Notes

To keep us focused on the class and on each other, we will keep laptops and other devices put away. Please bring copies of the relevant papers to class.

We will distribute handouts of our lecture material for you to take notes on. If you want to store all class material on your laptop, transcribing your handwritten notes after lecture is a great way to nail the material. We will post PDFs of the handouts after lecture to facilitate this process.

Software

We will program in Stata, a software program used widely by researchers and policy analysts. You will need Intercooled Stata to use the large datasets we will analyze.

Ford School Inclusivity Statement

Members of the Ford School community represent a rich variety of backgrounds and perspectives. We are committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value one another's opinions and communicate in a respectful manner
- keep confidential discussions that the community has of a personal (or professional) nature
- use this opportunity together to discuss ways in which we can create an inclusive environment in Ford classes and across the UM community

Accommodations for Students with Disabilities: If you believe you need an accommodation for a disability, please let your instructor know at your earliest convenience. Some aspects of courses may be modified to facilitate your participation and progress. As soon as you make your instructor aware of your needs, they can work with the Services for Students with Disabilities (SSD) office to help determine appropriate academic accommodations. Any information you provide will be treated as private and confidential.

Student Mental Health and Well-Being Resources: The University of Michigan is committed to advancing the mental health and wellbeing of its students. We acknowledge that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help,

contact [Counseling and Psychological Services](#) (CAPS) and/or [University Health Service](#) (UHS). For a listing of other mental health resources available on and off campus, visit: <http://umich.edu/~mhealth/>

Please review additional information and policies regarding academic expectations and resources at the Ford School of Public Policy: <http://fordschool.umich.edu/academics/expectations>

READING LIST

** indicates required reading*

I. Introduction

- Wednesday, January 8: Trends in Postsecondary Education (Sue lead)

Trends over time in educational attainment of the US population, 1940-present:

http://nces.ed.gov/programs/digest/2012menu_figures.asp

International comparisons of education levels in *OECD Education at a Glance*:

[http://www.oecd.org/edu/eag2013%20\(eng\)--FINAL%2020%20June%202013.pdf](http://www.oecd.org/edu/eag2013%20(eng)--FINAL%2020%20June%202013.pdf)

National Center for Educational Statistics, U.S. Department of Education. (2013a). Indicator 41, institutional retention and graduation rates for undergraduate students, Chapter 4 postsecondary education. In *The condition of education 2013*. Washington, D.C.: U.S. Department of Education. Retrieved from <https://nces.ed.gov/pubs2013/2013037.pdf> (p182).

National Center for Educational Statistics, U.S. Department of Education. (2013b). Indicator 42. Degrees conferred by public and private institutions, Chapter 4 postsecondary education. In *The condition of education 2013*. Washington, D.C.: U.S. Department of Education. Retrieved from <https://nces.ed.gov/pubs2013/2013037.pdf> (p186).

Bailey, M. & Dynarski, S. (2011). Gains and gaps: changing inequality in U.S. college entry and completion (NBER Working Paper No. 17633). Retrieved from NBER website: <http://www.nber.org/papers/w17633>.

College Board. (2013a). *Education pays*. Retrieved from <http://trends.collegeboard.org/sites/default/files/education-pays-2013-full-report.pdf>.

College Board. (2013b). *Trends in college pricing 2013*. Retrieved from <http://trends.collegeboard.org/sites/default/files/college-pricing-2013-full-report.pdf>.

College Board. (2013c). *Trends in student aid 2013*. Retrieved from <http://trends.collegeboard.org/sites/default/files/student-aid-2013-full-report.pdf>.

Chingos, Matthew, & Dynarski, S. (2015). [How can we track trends in educational attainment by parental income? Hint: Not with the Current Population Survey](#). Brookings Institution.

- Monday, January 13: Human Capital Model (Sue lead)

*Borjas, George (2005). "Human Capital," Chapter 7 in *Labor Economics* (McGraw Hill), pp. 235-79 (in Files on Canvas).

*Oreopoulos, P. (2007). [Do dropouts drop out too soon? Wealth, health and happiness from compulsory schooling](#). *Journal of Public Economics*, 91(11-12), 2213-2229.

Angrist, J., and J. Pischke (2009). *Mostly Harmless Econometrics*, Chapter 4, through 4.1.1

Angrist, J. and J. Pischke (2015). *Mastering 'Metrics*, Chapter 3, particularly 3.3

II. Returns to Education

- Wednesday, January 15 (Sue lead)

Murnane & Willett, Chapter 9

<http://ebookcentral.proquest.com.proxy.lib.umich.edu/lib/umichigan/detail.action?docID=578791>

- Monday, January 20: MLK Day, No class

- Wednesday, January 22 (Sue lead)

*Oreopoulos, Philip and Uros Petronijevic (2013). “[Making College Worth It: A Review of the Returns to Higher Education](#).” *The Future of Children* Volume 23, Number 1, Spring.

*Oreopoulos, P. (2006). [Estimating average and local average treatment effects of education when compulsory schooling laws really matter](#). *American Economic Review*, 96(1), 152-175.

- Monday, January 27 (Kevin lead): Returns to College

*Zimmerman, Seth (2014). “[The Returns to College Admission for Academically Marginal Students](#).” *Journal of Labor Economics* Vol. 32, No. 4 (October), pp. 711-754.

Hoekstra, M. (2009) “[The Effect of Attending the Flagship State University on Earnings: A Discontinuity-Based Approach](#)” *Review of Economics and Statistics* 91(4): 717–724 [US]

Ost, Ben, Weixiang Pan, Douglas Webber, 2018. “[The Returns to College Persistence for Marginal Students: Regression Discontinuity Evidence from University Dismissal Policies](#)” *Journal of Labor Economics*

Kirkebøen, Lars, Edwin Leuven, and Magne Mogstad, 2016. “[Field of Study, Earnings, and Self-Selection](#),” *The Quarterly Journal of Economics*, 2016, p. qjw019

Foote, Andrew and Kevin Stange. 2019. “[Migration from Administrative Data: Problems and Solutions with an Application to Higher Education](#)”

III. Effects of Student Aid: Grants, Free College, Tax Benefits

- Wednesday, January 29 (Kevin lead): Need-based Aid

*Scott-Clayton, Judith, 2017. [*Undergraduate Financial Aid in the United States*](#), (Cambridge, Mass.: American Academy of Arts & Sciences, 2017) - This provides a great overview of the history of financial aid, the main financial aid programs, and the empirical evidence. You should read these overviews in preparation for the discussion for the next two classes (you don't need to get through them all before Wednesday). Try to get a sense of the different types of financial aid, their relative importance, and some of the empirical challenges to assessing their effects

*Castleman, Benjamin L, and Bridget Terry Long. 2016. "[Looking beyond enrollment: The causal effect of need-based grants on college access, persistence, and graduation.](#)" *Journal of Labor Economics*, 34(4): 1023–1073.

Denning, J., B. Marx, and L. Turner, 2018. ProPelled: The Effects of Grants on Graduation, Earnings, and Welfare, *American Economic Journal: Applied Economics*, forthcoming. [US, RD]

Fack, Gabrielle and Julien Grenet, 2015. "Improving College Access and Success for Low-Income Students: Evidence from a Large Need-Based Grant Program" *American Economic Journal: Applied Economics* 2015, 7(2): 1-34.

Page, Lindsay C. and Judith Scott-Clayton, "[Improving college access in the United States: Barriers and policy responses](#)," *Economics of Education Review*, Volume 51, April 2016, Pages 4-22.

Angrist, J., and J. Pischke (2015). *Mastering 'Metrics*, Chapter 5.

Deming, David and Susan Dynarski (2010). "Into College, Out of Poverty? Policies to Increase the Postsecondary Attainment of the Poor," in eds Phil Levine and David Zimmerman. Available as [NBER working paper 15387](#).

Dynarski, Susan, and Judith Scott-Clayton. "[Financial Aid Policy: Lessons from Research.](#)" *The Future of Children* 23, no. 1 (2013): 67-91.

Carruthers, Celleste and Jilleah G. Welch. (2018). [Not Whether, but Where? Pell Grants and College Choices](#). Forthcoming, *Journal of Public Economics*.

- Monday, February 3 (Kevin lead): Merit-based Aid

*Cohodes, S. R., & Goodman, J. S. (2014). "[Merit aid, college quality, and college completion: Massachusetts' Adams scholarship as an in-kind subsidy](#)." *American Economic Journal: Applied Economics*, 6(4), 251-285. [also refer to online Appendix Tables]

Scott-Clayton, J. (2011). [On money and motivation a quasi-experimental analysis of financial incentives for college achievement](#). *Journal of Human Resources*, 46(3), 614-646. - bounding

Fitzpatrick, M. D., & Jones, D. (2016). [Post-baccalaureate migration and merit-based scholarships](#). *Economics of Education Review*, 54, 155-172.

Sjoquist, D. L., & Winters, J. V. (2015). [State merit aid programs and college major: A focus on STEM](#). *Journal of Labor Economics*, 33(4), 973-1006.

Dynarski, Susan (2003). "[Does Aid Matter? Measuring the Effect of Student Aid on College Attendance](#) ." *American Economic Review* (March).

- Wednesday, February 5 (Kevin lead): Free-College (Place-based)

*Bartik, T. J., Hershbein, B., & Lachowska, M. (2017). [The effects of the Kalamazoo Promise Scholarship on college enrollment, persistence, and completion](#).

*Carruthers, Celeste. 2019. "5 things to know about the Tennessee Promise Scholarship" Brown Center Chalkboard, Brookings Institution. May 6, 2019. <https://www.brookings.edu/blog/brown-center-chalkboard/2019/05/06/five-things-to-know-about-the-tennessee-promise-scholarship/>

Page, L. C., Iriti, J. E., Lowry, D. J., & Anthony, A. M. (2018). [The Promise of Place-Based Investment in Postsecondary Access and Success: Investigating the Impact of the Pittsburgh Promise](#). *Education Finance and Policy*, (Just Accepted), 1-60.

Harris, Douglas N., Raquel Farmer-Hinton, Debbie Kim, John Diamond, Tangela Blakely Reavis, Kelly Krupa Riflj, Hilary Lustik, & Bradley Carl. (2018). [The promise of free college \(and its potential pitfalls\)](#). Brown Center on Education Policy at Brookings.

Gurantz, Oded. 2019 What Does Free Community College Buy? Early Impacts from the Oregon Promise. *Journal of Policy Analysis and Management*. Forthcoming

- Monday, February 10 (Kevin lead): Free College in Reverse

*Andrews, Rodney and Kevin Stange. 2019. "[Price Regulation, Price Discrimination, and Equality of Opportunity in Higher Education: Evidence from Texas](#)" *American Economic Journal: Economic Policy*, 11(4): 31–65

Skim:

[Murphy, Richard, Judith Scott-Clayton, and Gillian Wyness, 2019. The end of free college in England: Implications for enrolments, equity, and quality.](#) *Economics of Education Review*. 71: 7-22.

OR

Murphy, Richard, Judith Scott-Clayton, and Gillian Wyness, 2017. "[Lessons from the end of free college in England](#)". Evidence Speaks Reports 2 (13). Washington, DC: The Brookings Institution.

Azmat, Ghazla and Stefania Simion, 2019. "Higher Education Funding Reforms: A Comprehensive Analysis of Educational and Labor Market Outcomes in England" unpublished working paper.

- Wednesday, February 12 (Kevin lead): HC vs. Signaling

*Arteaga, Carolina (2017). "[The effect of human capital on earnings: Evidence from a reform at Colombia's top university.](#)" *Journal of Public Economics*.

Clark, Damon and Paco Martorell, "The Signaling Value of a High School Diploma," *Journal of Political Economy*, Vol 122 (2, April 2014): 282-318

IV. Policies to Reduce Dropout and Increase Graduation Rates

- Monday, February 17 (Sue lead): ASAP

*Scrivener, Susan, Michael J. Weiss, Alyssa Ratledge, Timothy Rudd, Colleen Sommo, and Hannah Fresques (2015). “[Doubling Graduation Rates: Three-Year Effects of CUNY’s Accelerated Study in Associate Programs \(ASAP\) for Developmental Education Students.](#)” Read full report. MDRC.

*Dynarski, Susan (2015). “[How to Improve Graduation Rates at Community Colleges.](#)” March 11. *New York Times*.

- Wednesday, February 19 (Sue lead): ASAP Ohio & Dell

*Summo, Colleen, Dan Cullinan, Michelle Manno, Sean Blake, and Erick Alonzo (2018). “[Doubling Graduation Rates in a New State: Two-Year Findings from the ASAP Ohio Demonstration.](#)” Read full report. MDRC.

*Dynarski, Susan and Meghan Oster (2016). “[Fulfilling the Promise of Community College: The ASAP Demonstrations.](#)” 2016. Brookings Institution *Evidence Speaks* (December 1).

*Page, Lindsay, Stacy Kehoe, Benjamin Castleman, and Gumilang Sahadewo (2017). “[More than Dollars](#)” *The Journal of Human Resources* (December).

- Monday, February 24 (Sue lead): Tax Credits

*Hoxby, C. M., & Bulman, G. B. (2016). “[The effects of the tax deduction for postsecondary tuition: Implications for structuring tax-based aid.](#)” *Economics of Education Review*, Volume 51, April 2016.

*Dynarski, Susan (2016). “[\\$20 Billion in Tax Credits Fails to Increase College Attendance.](#)” April 19. *New York Times*.

- Wednesday, February 26 (Kevin lead): Differential Pricing

Methodologically we will discuss problems with the “two-way fixed effect” version of the difference-in-differences model and also workshop Assignment 2 as we discuss my paper on differential pricing.

*Stange, K. (2015). [Differential Pricing in Undergraduate Education: Effects on Degree Production by Field](#). *Journal of Policy Analysis and Management*, 34 (1), 107-135.

Blog post by [Pam Jakeila](#) on the Bacon decomposition

https://cdn.vanderbilt.edu/vu-my/wp-content/uploads/sites/2318/2019/10/09023516/so_youve_been_told_dd_10_9_2019.pdf

[Thread by @agoodmanbacon: In light of this question, I thought I'd do a little thread on purely practical event-study stuff. No theory, just a bunch of pictures of ho...](#)

- Monday, March 9 Affirmative Action Bans and Synthetic Controls

*Hinrichs, Peter 2012. “[The Effects of Affirmative Action Bans on College Enrollment, Educational Attainment, and the Demographic Composition of Universities](#).” *Review of Economics and Statistics*, Volume 94 | Issue 3 | August 2012 p.712-722

*McClelland Robert and Gault, Sarah , 2017. [The Synthetic Control Method as a Tool to Understand State Policy](#). Urban Institute, March 2017.

*Baker Dominique, 2019. “[Pathways to Racial Equity in Higher Education: Modeling the Antecedents of State Affirmative Action Bans](#).” *American Education Research Journal*, March 6, 2019.

OR "[Why might states ban affirmative action?](#)" Brookings Brown Center Chalkboard. Friday, April 12, 2019

For reference:

Abadie, Alberto, 2019. [Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects](#). *Journal of Economic Literature* (forthcoming)

[Stata command synth](#)

IV. Student Debt

- Wednesday, March 11 (Sue lead) - SARAH TURNER IS HERE

*Akers, Beth and Matthew Chingos (2016). [Game of Loans](#). Princeton University Press. Chapters 1-3

*Cellini, Stephanie, and Rajeev Darolia (2017). “[High Costs, Low Resources, and Missing Information: Explaining Student Borrowing in the For-Profit Sector](#).” *The ANNALS of the American Academy of Political and Social Science*.

*Looney, Adam and Constantine Yannelis (2015). “[A crisis in student loans? How changes in the characteristics of borrowers and in the institutions they attended contributed to rising loan defaults](#).” *Brookings Papers on Economic Activity*.

*Dynarski, Susan (2015). “[New Data Gives Clearer Picture of Student Debt](#).” September 10. *New York Times*.

*Scott-Clayton, Judith. (2018). [The looming student loan default crisis is worse than we thought](#). *Brookings Evidence Speaks Reports*, Vol. 2 No. 34.

- Monday, March 16 (Sue lead)

*Marx, Benjamin and Lesley Turner (2019). “[Student Loan Nudges: Experimental Evidence on Borrowing](#).” *AEJ Applied Economics*, Vol 11 (2) May 2019.(pp. 108-41)

- Wednesday, March 18 (Kevin lead): Community college & transfer

*Rouse, Cecilia E. 1995. “Democratization or Diversion? The Effect of Community Colleges on Educational Attainment.” *Journal of Business & Economic Statistics*, Vol. 13, No. 2, JBES Symposium on Program and Policy Evaluation (Apr., 1995), pp. 217-224 (8 pages)

*[Skim intro] Mountjoy, Jack. 2019. [Community Colleges and Upward Mobility](#). unpublished working paper. Watch this nice video summarizing this paper by Econimate: [Community Colleges and Upward Mobility](#) This has some pretty advanced econometrics that we won't fully get into. Just try to get the broad ideas.

- Monday, March 23: Learning communities. Sabrina Solanki will lead.

V. Higher Education Funding

- Wednesday, March 25 (Kevin lead): Funding and financing

*Webber, Douglas (2017). "[State divestment and tuition at public institutions](#)." *Economics of Education Review*, 60

*Archibald and Feldman, 2018. "[Drivers of the Rising Price of a College Education](#)"
Midwestern Higher Education Compact Policy Report, August 2018.

Review just for background:

[State Higher Education Finance: Fiscal Year 2017](#). State Higher Education Executive Officers Association.

Mitchell, Michael, Michael Leachman, and Kathleen Masterson (2017). "[A lost decade in higher education funding](#)." Center on Budget and Policy Priorities.

Hemelt, Steve, Kevin Stange, Fernando Furquim, Andrew Simon, and John Sawyer, 2019. "Why is Math Cheaper than English? Understanding Cost Differences in Higher Education"
NBER Working Paper

- Monday, March 30 (Kevin lead): Funding and completion

*Bound, John, Michael F. Lovenheim, and Sarah Turner (2010). "[Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources.](#)" *American Economic Journal: Applied Economics*, vol. 2(3), pages 129-157.

*Denning Jeffrey T Eric R. Eide Merrill Warnick [Why Have College Completion Rates Increased?](#) IZA Discussion Paper No. 12411.

- Wednesday, April 1 (Sue lead): Price caps & Spending

*Deming, David and Christopher Walters (2017). "[The Impact of Price Caps and Spending Cuts on U.S. Postsecondary Attainment.](#)" NBER working paper 23736.

- Monday, April 6 (Sue lead): College quality & accountability

*Dale, S. B., & Krueger, A. B. (2014). [Estimating the effects of college characteristics over the career using administrative earnings data.](#) *Journal of Human Resources*, 49(2), 323-358.

* SKIM Deming, David and David Figlio (2016). "[Accountability in US Education: Applying Lessons from K-12 Experience to Higher Education.](#)" *Journal of Economic Perspectives*.

- Wednesday, April 8 (Kevin lead) College choice

*Jacob, B., B. McCall, and K. Stange. 2018. "[College as Country Club: Do Colleges Cater to Students' Preferences for Consumption?](#)" *Journal of Labor Economics*, 36(2): 309-348.
[US, discrete choice]

Delavande, Adeline and Basit Zafar, 2018. "University Choice: The Role of Expected Earnings, Non-pecuniary Outcomes and Financial Constraints." forthcoming, *Journal of Political Economy* [Pakistan, discrete choice / preference solicitation]

Hastings, Justine, Christopher A. Neilson, and Seth D. Zimmerman, 2015. "The Effects of Earnings Disclosure on College Enrollment Decisions." NBER Working Paper No. 21300 June 2015 [Chile, field experiment / discrete choice]

VI. Nontraditional Students and Institutions

- Monday, April 13 (Sue lead): For-profits

*Cellini, Stephanie and Nicholas Turner (2018). "[Gainfully Employed? Assessing the Employment and Earnings of For-Profit College Students Using Administrative Data.](#)" *Journal of Human Resources*. NBER Working Paper here: <https://www.nber.org/papers/w22287.pdf>

Cellini, Stephanie Riegg, Cory Koedel, Gregory Gilpin, & Christiana Stoddard, (2017). [Point-Counterpoint: Should For-Profit Colleges Receive Federal Student Aid?](#) *Journal of Policy Analysis and Management* Volume 36, Issue 4, Fall 2017: 933-956.

Gilpin, Gregory A., Saunders, Joseph and Stoddard, Christiana, (2015), [Why has for-profit colleges' share of higher education expanded so rapidly? Estimating the responsiveness to labor market changes](#), *Economics of Education Review*, 45, issue C, p. 53-63.

Cellini, Stephanie Riegg, Rajeev Darolia, and Lesley J. Turner, "Where Do Students Go When For-Profit Colleges Lose Federal Aid?" *American Economic Journal: Economic Policy*, forthcoming. [[NBER Working Paper No. 22967](#)]

- Wednesday, April 15 (Kevin lead): Online

We'll discuss, in a pretty unstructured way, many of the themes in the Deming article. What do you think will/should happen? The two other articles are key pieces of evidence on the effects of online.

Deming, David. 2020. [Online Learning Should Return to a Supporting Role](#) NYT April 9, 2020

Bettinger, Eric P., Lindsay Fox, Susanna Loeb, and Eric S. Taylor. 2017. "[Virtual Classrooms: How Online College Courses Affect Student Success](#)." American Economic Review, 107 (9): 2855-75.

Goodman, Joshua Julia Melkers, and Amanda Pallais, 2019. "[Can Online Delivery Increase Access to Education?](#)," Journal of Labor Economics 37, no. 1 (January 2019): 1-34.

- Monday, April 20 (both lead)

Discuss Assignment 3. Wrap up

CUT: Postsecondary for older students

* Jacobson, L., LaLonde, R., & Sullivan, D. G. (2005). [Estimating the returns to community college schooling for displaced workers](#). *Journal of Econometrics*, 125(1-2), 271-304.

Belfield, C., & Bailey, T. (2017). [The Labor Market Returns to Sub-Baccalaureate College: A Review](#). A CAPSEE Working Paper. *Center for Analysis of Postsecondary Education and Employment*.

Carruthers, C. K., & Sanford, T. (2018). [Way station or launching pad? Unpacking the returns to adult technical education](#). *Journal of Public Economics*, 165, 146-159.