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RAISING STATE MINIMUM WAGES, LOWERING COMMUNITY COLLEGE ENROLLMENT

Diane Whitmore Schanzenbach
Julia A. Turner
Sarah Turner

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ABSTRACT

While the direct impacts of minimum wage changes on employment have received considerable attention, these policy changes have the potential to impact skill attainment by changing the opportunity cost of college enrollment. Using institutional data on college enrollment and program completion, we find that enrollment falls markedly among students at public two-year institutions in response to increases in the minimum wage. The largest enrollment effects are seen for those students who are enrolled in part-time courses of study at community colleges. The effect of minimum wage changes on credential attainment is limited to modest effects for women at the associate degree level, suggesting that the changes primarily impact the enrollment of students who are unlikely to have been diverted from degree attainment.

Diane Whitmore Schanzenbach
Institute for Policy Research
Northwestern University
2040 Sheridan Road
Evanston, IL 60208
and NBER
dws@northwestern.edu

Julia A. Turner
Northwestern University
2120 Campus Drive
Evanston, IL 60208
juliaturner@u.northwestern.edu

Sarah Turner
Department of Economics
University of Virginia
Monroe Hall
248 McCormick Rd
Charlottesville, VA 22904
and NBER
set5h@virginia.edu

1 Introduction

How changes in local, state and federal minimum wage requirements impact college enrollment and attainment is theoretically ambiguous and empirically unresolved. While employment impacts of minimum wage policies have been the subject of high-decibel debate and notable measurement innovations, post-secondary enrollment has received much less attention even as many potential college students receive wages near the statutory minimum wage.[1]

For many college students, particularly those enrolled in community colleges, working and studying go hand-in-hand. Overall, 49% of college students and 55% of students at community colleges are employed. This considerable overlap between employment and enrollment suggests scope for adjustment—specifically trading off between the two states—in the case of an expected wage change.[2] In one conception of this impact, increased wages may reduce enrollment due to an increased opportunity cost of pursuing post-secondary education. On the other hand, an increase in the minimum wage may increase enrollment through reduced credit constraints for individuals who are both employed and enrolled as well as changed employment opportunities.

Some basic empirical facts serve to motivate our analysis of the effect of minimum wage changes on college enrollment and attainment. First, there have been nearly 400 state-level changes in the minimum wage between 1986 and 2019, with 239 state-level minimum wage increases of at least 6% and 96 increases of 10% or more. Over this same period, post-secondary enrollment rose from about 15 million in 2000 to a peak of more than 21 million students in 2010, before declining to 18.9 million students in 2019 (De Brey et al. 2021). Enrollment changes at community colleges have been particularly noteworthy: rising from about 5.7 million students in 2000 to 7.2 million students in 2010 and then falling precipitously to 4.7 million students in 2019. Finally, the employment rate of those in college grew modestly between 1990 and 2000, declined markedly during the Great Recession, and has yet to recover to pre-2008 levels.

Overlaid on these broad trends are concerns about the extent to which individual credit constraints and stagnant post-secondary funding at the state-level may limit collegiate attainment and economic

[1] The publication of David Card and Alan Krueger's *Myth and Measurement* in 1995, along with the related paper in the American Economic Review (1994), generated a wave of critique including a volume of response papers in the Industrial and Labor Relations Review by researchers including Richard Freeman, Dan Hamermesh, Charles Brown and Finis Welch. More recently, research papers like Dube, Lester and Reich (2010) and Cengiz et al. (2019) have brought new research designs and enhanced econometric techniques to the question of whether changes in the minimum wage impact employment, while debate over methodology data and results persists (Neumark, Salas and Wascher 2014).

[2] To be sure, many college students are not likely to be impacted by minimum wage policies. These inframarginal students include those who do not work while enrolled in college and those who are likely to be largely inelastic in their enrollment demand (including those attending full-time residential institutions), as well as those who are unlikely to consider enrollment.

mobility. At the same time, changes in the availability of federal financial aid, including Pell grants and student loans, may impact individual enrollment decisions as financial aid may serve to ease credit constraints and the need to work while enrolled. Analysis of the impact of the minimum wage on post-secondary enrollment and attainment serves to address questions of whether increases in the minimum wage serve to mitigate credit constraints or distort individual decision-making with respect to enrollment and employment.

This paper uses a stacked event study to estimate the impact of minimum wage increases on enrollment and attainment. Our analysis makes use of federal administrative IPEDS data on enrollment by type of institution, intensity of enrollment, and student demographics in conjunction with a full panel of data on state educational and economic conditions. Our findings provide clear evidence that a minimum wage increase has negative enrollment effects for a specific subset of students. Specifically, students enrolled part-time at community colleges are most impacted by changes in the minimum wage. Conversely we find no detectable enrollment effects for students enrolled in four-year colleges. These findings, alongside null to modest effects of the minimum wage on attainment of certificates or degrees, suggest that students for whom the minimum wage impacts enrollment are weakly attached to post-secondary attainment and unlikely to have been diverted from degree attainment by the changing minimum wage.

2 Research Background

While early research on the impact of minimum wage changes on enrollment and skill acquisition focused particularly on high school enrollment and completion (Mattila 1981; Ehrenberg and Marcus 1982; Neumark and Wascher 1995*a*,*b*), we focus on the margin of post-secondary enrollment. At this stage, individuals have moved beyond the age of compulsory attendance and they face direct choices about work and schooling that are subject to constraints of the labor market and their own capacity to finance post-secondary education.

The theoretical ambiguity of the predicted sign and magnitude of an enrollment effect stems from the presence of both income and substitution effects in response to a minimum wage increase. A higher minimum wage increases the opportunity cost of enrollment and leisure activities. Some individuals may respond to this changing opportunity cost by increasing their labor supply and reducing enrollment on the intensive or extensive margin, i.e. decreasing the number of courses taken or dropping out of school.[3] For

[3]There is some existing evidence that increasing hours of employment has negative effects on academic attainment. Stinebrickner and Stinebrickner (2003) take advantage of unique variation in which all students at a small college are

other students a higher minimum wage may increase enrollment, for example if additional income reduces credit constraints that might otherwise limit their ability to enroll. Additionally, general equilibrium enrollment decisions necessarily depend on the extent to which a change in the minimum wage impacts employment prospects or the skill requirements of employers.

With more than 18.9 million students enrolled in post-secondary education in 2020 across institutions ranging from research universities to community colleges, the likelihood of heterogeneous enrollment effects should be no surprise (De Brey et al. 2021). Indeed, many students enrolled in post-secondary education are unlikely to be impacted by minimum wage changes as their existing wage exceeds the prevailing minimum wage or their enrollment demand is inelastic to changes in the minimum wage. Graduate students and students enrolled at institutions providing full financial aid are likely to be in this latter category. Potential students who are likely to be impacted by changes in the minimum wage are those at community colleges and broad-access institutions. These are often public institutions, receiving substantial appropriations from state governments.

The broad reach of community colleges in the United States merits particular note as they serve a range of functions including job training in vocational-technical fields as well as enabling students to transfer to a BA-level program with two years of academic credit. Some students at community colleges are first-time college students while others are returning to community college enrollment after years in the labor market. Relative to students at four-year public institutions, students at community colleges are much more likely to attend part time (68% versus 30%) and are more likely to be over the age of 21 (43% versus 33%).

The extent to which students mix school and employment varies with age and type of institution. Among students ages 18-24, 58% of community college students are employed (with those employed working an average of 15 hours per week) relative to about 46% of students at four-year institutions (who work an average of 9.8 hours per week); among students ages 25-35 nearly two-thirds of students enrolled at both two-year and four-year are employed, with these students working an average of about 23.5 hours per week. In turn, among students combining work and enrollment at the post-secondary level, community college students are those most likely to report wages in the range of prevailing minimum wage levels. Among employed community college students, 27% earn $10 or less hourly and 59% earn

required to work at least 10 hours per week, while assignment to campus jobs is random. With variation in hours above the 10 hour minimum, the authors use initial job assignments to instrument for hours worked. They find that an additional hour worked per week decreases the first semester grade point average. In addition, work by Scott-Clayton (2012) shows that participation in Federal Work-Study (FWS) funds is linked to significant declines in GPA and graduation rates for women, while there are some indications of positive effects for men.

$12 or less; comparable rates in 4-year institutions are 19% and 42%, respectively. (Tabulations are from authors' calculations using the Current Population Survey.)

Measured Enrollment Responses: Minimum Wage Changes

The empirical study of enrollment responses to changes in the minimum wage has been addressed with mixed findings and limited data since the 1970s. Many early papers including Neumark and Wascher (1995*a*, 2003) found evidence of changes in high school enrollment and high school completion, given the well-established incidence of high school workers often receiving the minimum wage. Yet, a barrier to interpretation of unconstrained enrollment effects in these data is that many high school-age students may also be subject to compulsory schooling laws, which would limit labor supply to a degree. In fact, Chaplin, Turner and Pape (2003) find that these disenrollment effects among high school students disappear in states where enrollment is mandated until age 18.

Early studies that directly estimate the impact of changes in the minimum wage on post-secondary enrollment have grappled with limited data, which has likely contributed to inconsistent results.[4] Many of these studies rely on the Current Population Survey which is limited in enrollment measures in most months. Only the October Supplement asks about college enrollment for all workers, and the resulting sample sizes are insufficiently small. Until 2012, the basic monthly surveys only recorded enrollment for those younger than 24, missing many older student-workers. In other months, the only mechanism for capturing enrollment is a question on "major activity last week," asking respondents who are simultaneously employed and enrolled to choose their primary activity and contributing to measurement error in the classification of enrollment.

Several recent investigations have used alternative data sources and econometric advances to explore the impact of changes in the minimum wage on post-secondary enrollment. Lee (2020) examines border pairs of communities similar to Dube, Lester and Reich (2010), who use minimum wage differences across border counties and finds little effect of the minimum wage on employment. The Lee (2020) analysis uses institutional data on enrollment from IPEDS and finds that increases in the minimum wage led to reductions in enrollment at community colleges; these effects appear to be concentrated among those enrolled part time. Lee finds that a 10% increase in the minimum wage predicts a 4.4-5.0% decline in enrollment overall, with part-time enrollment declining by 5.2-6.1% and little effect on full-time enrollment.

[4] A related question addressed by Baker (n.d.) and Acemoglu and Pischke (1999) is that increases in the minimum wage may serve to reduce on-the-job training because the effective "floor" on the price of low-skilled labor may undermine this mechanism for skill acquisition.

Recent work by Li (2022) uses administrative student-level data from California paired with the distinctive municipal/county changes in minimum wage levels in California in recent years. Li focuses on the impact of minimum wage changes specifically for students transitioning from their senior year in high school to post-secondary education options, finding that students from lower-income families increase their enrollment at community colleges and students with relatively high achievement shift their enrollment to more selective four-year public institutions.

The absence of consensus in recent work likely reflects significant differences in behavioral responses tied to student circumstances and program of study. In turn, the available evidence provides little indication of how enrollment declines caused by increased minimum wage increases impact educational attainment.

Measured Enrollment Responses: Local Labor Markets

Enrollment responses to shifts in state and local labor market conditions may inform examination of the impact of minimum wage changes. It has long been hypothesized (and shown empirically) that collapses (or booms) in local labor markets impact enrollment decisions (Betts and McFarland 1995; Barr and Turner 2013; Charles, Hurst and Notowidigdo 2018). The logic is straightforward: changes in local labor market conditions alter the opportunity cost of enrollment.

In an older analysis, Betts and McFarland (1995) show that the enrollment at community colleges is sensitive to changes in local unemployment rates, with enrollment rising appreciably for adults above and beyond recent high school graduates (a 1 percentage point change in the unemployment rate predicts a 4 percent increase for adults overall, relative to about 0.5 percent for recent high school graduates). Focusing on the variation in enrollment and local labor market conditions over an interval that included the Great Recession, Barr and Turner (2013) find that recessionary conditions and weak labor markets have a substantial impact on short-duration enrollment and training opportunities. Similar to the findings in Betts and McFarland (1995), many students who choose to pursue such options are older than recent high school graduates.[5] In turn, they find that much of the increase in enrollment occurred in the sectors of higher education that are likely to be most elastic in supply: community colleges, open-access public four-year institutions, and for-profit institutions.

[5]Barr and Turner (2013) find that the response in enrollment to changes in local labor market conditions measured by the unemployment rate is greater for students in their 20s than recent high school graduates. They find a within-state change in the unemployment rate of 5 percentage points predicts a 17 percent increase in enrollment for those ages 20–24 and a 12 percent increase for those ages 18–19. See also Foote and Grosz (2020) and Stevens, Kurlaender and Grosz (2019) who find increases in career and technical enrollment in response to mass layoffs and other changes in local labor markets.

How changes in enrollment induced by local labor market adjustments translate to changes in attainment is of significance as it addresses whether the impacts primarily affect the timing of enrollment or more permanently alter the stock of educational attainment. Charles, Hurst and Notowidigdo (2018) examine the enrollment and attainment changes tied to housing booms (and busts) at the local level which differentially impacted post-secondary enrollment decisions, and find that the housing boom accounted for as much as 25 percent of the enrollment slowdown. Although the causal force was transitory changes in the opportunity cost of enrollment, they find that the attainment effects in terms of completion of sub-baccalaureate credentials are permanent.

The analogy between minimum wage policy changes and changes in local labor market conditions as factors impacting post-secondary enrollment is straightforward yet incomplete. A higher minimum wage increases the opportunity cost of schooling and may place downward pressure on enrollment, while a higher local unemployment rate tends to decrease the opportunity cost of enrollment and likely places upward pressure on enrollment. Nonetheless, at least three factors differentiate these cases: first, weakness in local labor markets may be expected to be transitory while minimum wage changes are expected to be persistent; second, the populations impacted may not be fully overlapping; and third, a local labor demand shift necessarily has different implications for employment opportunities than a change in the minimum wage, with magnitudes depending on elasticities of supply and demand.

3 Empirical Approach

The existing literature studying the relationship between enrollment and the minimum wage has largely relied on observational methods to estimate the elasticity of enrollment with respect to the minimum wage. With the exception of Li (2022), which studies the effect of local minimum wage changes in California, few studies have used quasi-experimental variation to estimate the enrollment response to an increase in the minimum wage. This is in sharp contrast to the broader minimum wage literature, which has seen important empirical innovation over the last decade.

In our setting, the key empirical challenge in measuring the response of post-secondary enrollment to a change in the minimum wage is estimating the state-level counterfactual enrollment patterns in the absence of the change. To best leverage changes in the minimum wage that are staggered across years and states, we take a stacked event-study approach as in Schwab, Autor and Donohue (2006); Cengiz et al. (2019). The stacked approach treats each *relevant* minimum wage change as its own event (e), creating

individual datasets for each event and estimating enrollment effects in the eight-year window around that event. Every state that is not the event-specific state in question is treated as a control state. Over this time period, many control states experience their own relevant and/or minor minimum wage increases. We control for these and for federal minimum wage changes to assure they do not confound the main effects. Specifically, we construct indicator variables equal to one if a control state experiences their own minimum wage change during the pre ($-3 \leq \tau < 0$) or post ($0 \leq \tau \leq 4$) period of the eight-year treatment window. These dummies are then included in the regression specification as ω_{st} in Equation 1.[6]

The event-study regression equation is then:

$$Y_{st} = \sum_{\tau=-3}^{4} \alpha_\tau I_{st}^\tau + \mu_s + \rho_t + \omega_{st} + X_{st} + \varepsilon_{st} \tag{1}$$

where Y_{st} is the outcome variable—in our main results Y_{st} is log enrollment or log degree completions in two- or four-year colleges—in state s at time t. The treatment indicator I_{st}^τ is equal to one if state s saw a minimum wage increase τ years from year t. This specification controls for state-by-event effects as well as time-by-event effects. ω_{st} is an indicator that controls for any other minimum wage changes (federal, minor, or relevant) that take place within the eight panel years of dataset e, and X_{st} is a vector of additional controls for unemployment rate, young adult population (aged 18-30), and an indicator variable equal to one if community college attendance is free to state s residents in year t. Standard errors are clustered by state, the level at which policy changes occur.

This design identifies the causal effect of a minimum wage change on post-secondary enrollment and degree completion under the assumption that, in the absence of the change, outcomes in treated and untreated states would have evolved similarly. As in the standard event-study case, this assumption cannot be directly tested, but pre-trends can be observed in the years leading up to the change. The results presented in Section 5 assess the visual existence of pre-trends.

As the data are cross-sectional, we estimate the impact of a minimum wage change on year-to-year enrollment experienced by institutions in the affected state as a whole, rather than the enrollment decisions of a given student. This is an incomplete measurement of the effect of a minimum wage change, as there is room for dynamic movement by students in response to minimum wage changes. Take a student who graduates from high school the year that a state announces it will raise its minimum wage. That student may have directly enrolled in a two-year college in the absence of an increase in the minimum wage,

[6] Our results are robust to creating "clean" datasets for each event. In these "clean" datasets we define control states as those that do not experience a relevant minimum wage change in the eight year panel around event e. Control states that do experience a minimum wage increase exceeding the relevance threshold are dropped from the event-specific dataset.

but now she decides to take a year off to work full-time and earn income which she will use to attend college in the following year. Such a student is captured as negative enrollment in the first year after the minimum wage change ($\tau+1$), but enters as positive enrollment, matching her counterfactual state, in the measurement of the treatment effect in $\tau+2$. The results presented in Section 5 use a four-year follow-up window, but the extent to which capturing longer-run effects is desirable given our data constraints remains ambiguous.

In some cases, we replace the event-study model in Equation 1 with a difference-in-differences approach. In this case, the regression equation becomes:

$$Y_{st} = \alpha POST_{st} + \mu_s + \rho_t + \omega_{st} + X_{st} + \varepsilon_{ste} \tag{2}$$

where $POST_{st}$ is an indicator variable equal to one for years $0-4$ in the event-study, and equal to zero for years -3 to -1. Other variables are defined as in Equation 1, and standard errors are clustered at the state level.

4 Data

Data for this study come from several sources. We link minimum wage levels and changes at the state level to post-secondary enrollment and completions. As described below, we also control various state-level characteristics. Below we provide information on each data source and our sample construction.

IPEDS

We use post-secondary enrollment data from the Integrated Post-secondary Education Data System (IPEDS), an administrative data set provided by the National Center for Education Statistics (NCES). The enrollment data span 1986-2019 and cover the universe of Title IV-eligible U.S. post-secondary institutions. We restrict the data to degree-granting institutions and classify institutions as "two-year" or "four-year." Institutions are classified as two-year if their highest or predominant degree offered is an associate degree, and four-year if the predominant degree offered is a bachelor's degree or above, given they are not graduate-degree only institutions. The outcomes of interest are total fall enrollment and degree completion, which are both measured at the institution level. Enrollment includes students who are enrolled either part-time or full-time, but does not indicate the type of degree program students in which are enrolled.

Minimum wage data

Data on the minimum wage come from the state-level monthly minimum wage series described in Vaghul and Zipperer (2022). The authors assemble state-level historical minimum wage data using a variety of sources including state legislation and resolutions, federal reports from the Bureau of Labor Statistics (BLS), reports from state and local agencies, and communications from state labor departments.

As the outcomes of interest are enrollment and completion, which occur on the academic calendar timeline, relevant minimum wage changes occur in the academic year preceding the year of enrollment/completion. This is especially relevant for enrollment, which is measured in the Fall in the IPEDS data. For example, regardless of whether a minimum wage change happened in December 2013 or January 2014, Fall 2014 enrollment is the corresponding outcome of interest.[7] Thus, we align minimum wage changes with the academic year in which they occur rather than the calendar year. Rather than measure the enrollment response to a nominal change in the minimum wage (50 cents, 75 cents, etc.), we classify minimum wage changes by the size of the change in relation to the prevailing minimum wage. In Section 5, we present estimates for minimum wage changes of at least 8%, and in the appendix we examine impacts of minimum wage changes that are at least 6% and 10%, with similar results especially in the first two years after the change.[8] Any minimum wage change that is smaller than the given level is considered a "minor" change. Moving forward, we refer to "relevant" versus "minor" changes with relevance defined by the given level of change.

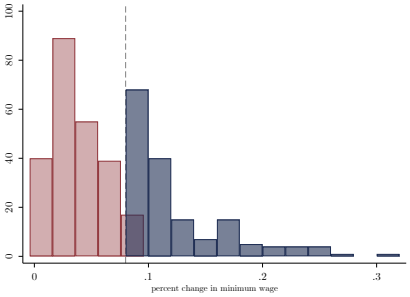
Figure 1 shows the frequency and geographic distribution of minimum wage changes. As shown in Panel A, many of minimum wage changes at the state level are minor. Between the academic years of 1986 and 2019, nearly 400 minimum wage changes occur at the state level; 170 of these were an 8% increase or larger. As shown in Panel B, state-level minimum wage changes are prevalent but not ubiquitous. 14 states had no relevant state-level minimum wage changes from 1986 to 2019. These states are largely concentrated in the South and Rocky Mountain regions of the United States. Panel C shows a timeline of minimum wage changes, with relevant changes denoted by blue circles, minor changes denoted by red squares, and federal changes represented by gray vertical lines. The relevant minimum wage changes that identify our impacts tend to be fairly well-distributed across years.

[7] Results are robust to using calendar year rather than academic year alignments.

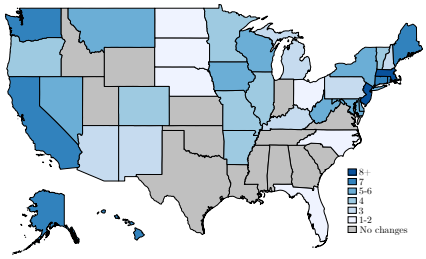
[8] It is common in this literature to focus on changes that have significant "bite," meaning that individuals are impacted by the change (Cengiz et al. 2019). We show, however, that enrollment responses are not sensitive to the size of the minimum wage change.

Figure 1
Characteristics of Minimum Wage Changes

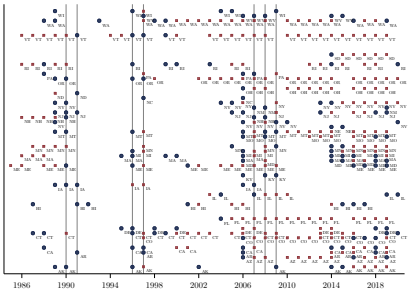
Panel A: Histogram of Changes



Panel B: Map of 8%+ Changes



Panel C: Timeline of 8%+ Changes



Notes: There are 170 minimum wage changes of 8% or more during the sample period. The left panel of this figure shows a histogram of all minimum wage changes from 1986 to 2019, with blue indicating relevant minimum wage changes, while red indicating minor minimum wage changes, and the gray line indicates the 8% threshold. The middle panel shows a map of the number of 8%+ minimum wage increases by state during the sample period. The right panel shows a timeline of minimum wage changes, with those of magnitude 8% or larger shown as blue circles and minor changes shown as red squares. Gray lines represent federal changes to the minimum wage.

Additional outcomes and state characteristics

In order to test the robustness of our estimates we collect additional state characteristics to serve as control variables. We use data from the American Community Survey and the Community Population Survey (CPS) on the state-level population and age distribution as well as the racial composition of each state. Unemployment rate data come from the Bureau of Labor Statistics, and information on free community college programs at the state level were hand-collected using online legislative, media, and research resources.

5 Results

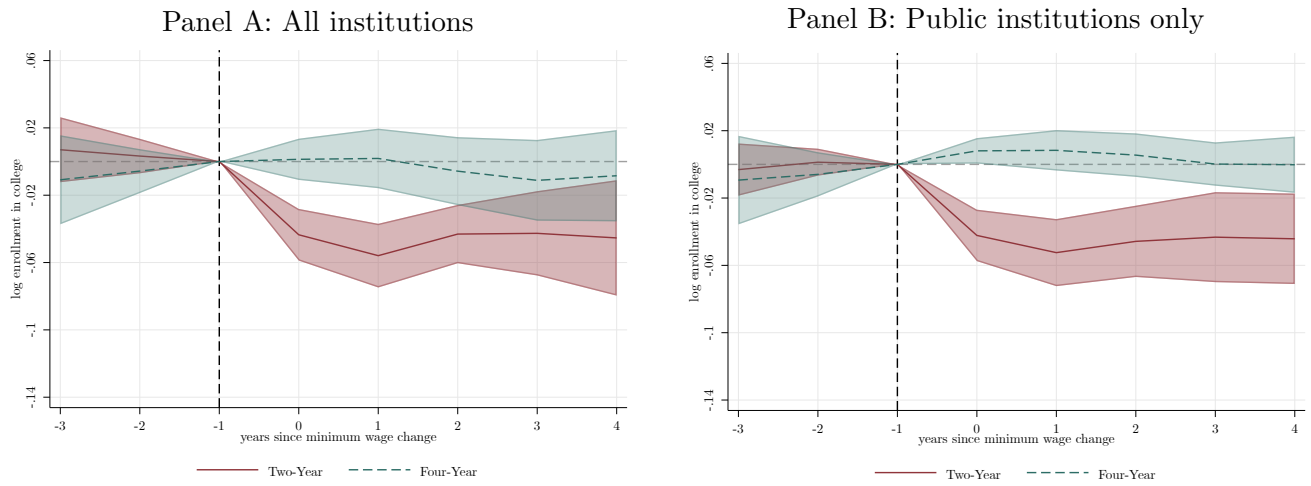
We begin our analysis by documenting the impacts of minimum wage increases on enrollment by institution type, full vs. part-time enrollment, and gender using the stacked event-study approach described above.

Enrollment Impacts

Figure 2 graphs event-study results for two- and four-year enrollment across all institutions (Panel A) and public institutions only (Panel B). In the year following a relevant minimum wage increase, two-year enrollment drops by just over 4% across all institutions. The enrollment decline is little changed over the subsequent four years, and by year 5 two-year enrollment remains down by about 4%. There are no

substantial or statistically significant pre-trends in two-year enrollment prior to the minimum wage event. In contrast, there is no change in four-year enrollment after a minimum wage increase. As shown in Panel B, results are similar when the sample is limited to public institutions only, which account for 88% of two-year enrollment and 68% of four-year enrollment.[9] The decline in two-year enrollment at public institutions is not sensitive to size of the minimum wage change. Using changes of greater than 6% and greater than 10% to estimate enrollment effects yields statistically indistinguishable results (Appendix figure A.5).

Figure 2
Impact of minimum wage change (8% or more) on post-secondary enrollment



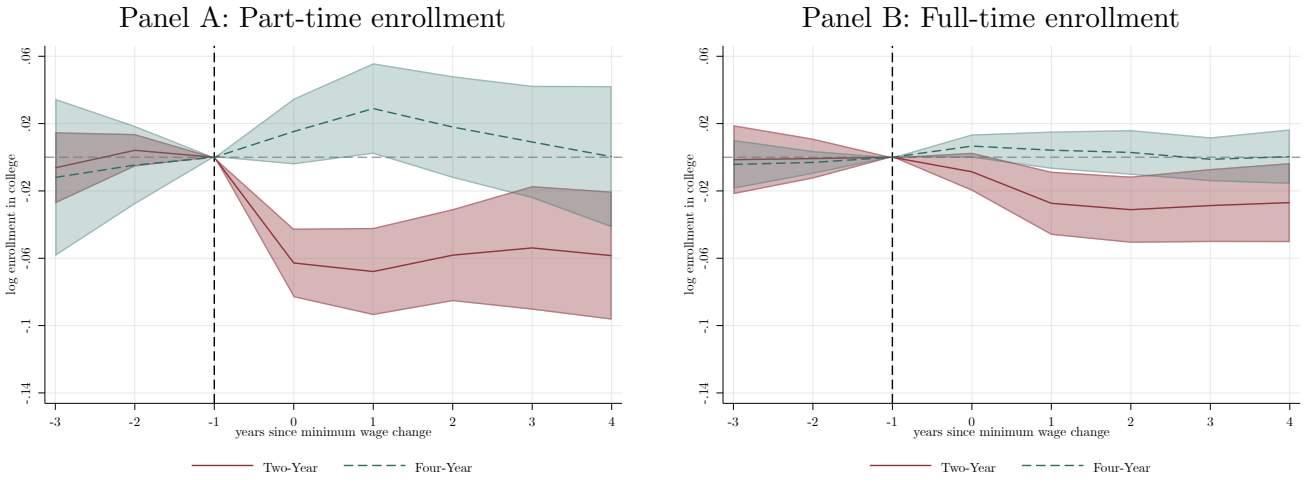
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in two- and four-year colleges. Panel A presents results for all institutions. Panel B presents results for only public institutions. The shaded region indicates 95% confidence intervals. Minimum wage changes are defined as an increase of 8% or more on the base. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. Red identifies changes in two-year college enrollment. Green identifies changes in four-year college enrollment. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

Focusing on public institutions, Figure 3 repeats the event-study analysis separately for part-time (Panel A) and full-time (Panel B) enrollment in two- and four-year colleges. Among two-year colleges, part-time enrollment (which comprises 60% of 2-year enrollment) drops by 6% in the year following a relevant minimum wage increase, and remains at that lower level through the end of the sample period. Among four-year colleges, part-time enrollment (which comprises 19% of 4-year enrollment) appears to swell a little, with enrollment up a marginally statistically significant 3% by year two after a relevant minimum wage change then indistinguishable from zero in subsequent years. The impacts of a relevant

[9]These results are little changed when controls for racial and ethnic group-specific populations aged 18-30 included, see A.4.

minimum wage increase are more muted on full-time enrollment in two-year institutions, but nonetheless there is a persistent 2% decline in two-year enrollment. Event-study estimates of four-year, full-time enrollment are small and statistically indistinguishable from zero.

Figure 3
Impact of minimum wage change (8%) on public part-time versus full-time enrollment



Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in two- and four-year colleges. Panel A presents results for part-time enrollment in public post-secondary institutions. Panel B presents results for full-time enrollment in public post-secondary institutions. The shaded region indicates the 95% confidence interval. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. Red identifies changes in two-year college enrollment. Green identifies changes in four-year college enrollment. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

We report difference-in-differences estimates of the impact of a relevant minimum wage increase on enrollment (through 5 years post-change) in Table 1, adding estimates separately by gender and for for-profit institutions.[10] While women are more likely than men to attend two-year institutions (comprising nearly 60% of enrollment at public two-year institutions), the (log) enrollment response to a minimum wage change is indistinguishable across genders. Overall and for both full-time and part-time students, a minimum wage increase results in a statistically significant decrease in enrollment at two-year institutions. On the other hand, impacts on four-year enrollment are small and generally not statistically different from zero. One exception is a small but statistically significant increase in part-time enrollment in public, four-year institutions in the first few years after a minimum wage increase, which dissipates quickly in the event study and is not statistically significantly distinguishable from zero in the difference-in-differences specification.

[10]Corresponding event-study coefficients for years 0 to 3 are shown in Appendix Tables A.1 and A.2 .

Our evidence on the enrollment response to minimum wage increases at the sub-baccalaureate two-year for-profit colleges (Panel C of Table 1) shows large negative impacts of minimum wage changes that are often imprecisely estimated. These institutions are often small in scale and specialize in vocational and technical training (e.g., auto mechanics or cosmetology). In pursuing regulations such as Gainful Employment, the federal government has identified high default rates and low earnings for those attending these institutions in many cases, which in turn has raised concerns among policy makers (Cellini and Turner (2019)). A question which we are unable to answer in our data is whether the observed enrollment declines are largest at those institutions that have the lowest labor market returns.

Table 1 – Impact of minimum wage change (8% or more) on post-secondary enrollment

	Two-year enrollment			Four-year enrollment		
	Total	Men	Women	Total	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: All Institutions						
Total enrollment	-0.046 ***	-0.046 ***	-0.048 ***	-0.003	0.000	-0.007
	(0.008)	(0.011)	(0.007)	(0.008)	(0.009)	(0.007)
Full-time enrollment	-0.033 ***	-0.026 ***	-0.037 ***	-0.003	-0.002	-0.004
	(0.009)	(0.009)	(0.010)	(0.005)	(0.005)	(0.004)
Part-time enrollment	-0.045 ***	-0.051 ***	-0.043 ***	-0.006	0.002	-0.013
	(0.012)	(0.018)	(0.010)	(0.025)	(0.028)	(0.023)
Panel B: Public Institutions						
Total enrollment	-0.046 ***	-0.052 ***	-0.043 ***	0.006	0.007	0.004
	(0.009)	(0.013)	(0.007)	(0.005)	(0.005)	(0.004)
Full-time enrollment	-0.024 ***	-0.024 ***	-0.026 ***	0.003	0.004	0.002
	(0.008)	(0.008)	(0.008)	(0.005)	(0.005)	(0.004)
Part-time enrollment	-0.061 ***	-0.072 ***	-0.054 ***	0.018	0.015	0.019
	(0.012)	(0.018)	(0.010)	(0.011)	(0.011)	(0.012)
Panel C: For-Profit Institutions						
Total enrollment	-0.088	-0.097	-0.094	-0.035	0.058	-0.074
	(0.061)	(0.067)	(0.060)	(0.162)	(0.168)	(0.170)
Full-time enrollment	-0.070	-0.062	-0.084	0.051	0.102	0.039
	(0.052)	(0.062)	(0.052)	(0.146)	(0.153)	(0.155)
Part-time enrollment	-0.164	-0.141	-0.218 *	-0.050	0.019	-0.090
	(0.127)	(0.102)	(0.122)	(0.079)	(0.088)	(0.086)

Notes: This table gives the results of a stacked difference-in-difference measuring the impact of a state-level minimum wage increase on enrollment in two- and four-year colleges in the post-period after the change. Standard errors are given in parentheses. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level.

In the first few years after a minimum wage increase, the point estimates on enrollment decline and

are somewhat larger among Hispanic students than among Black or White students, but the differences are not statistically significant (Appendix figure A.7). Results are quite similar for men and women in each racial/ethnic category (Appendix figure A.8).

In summary, we find that minimum wage increases reduce enrollment at two-year colleges across the board—for full-time and part-time students, for men and women, and across the public and for-profit sectors. The negative impact persists for at least 5 years after the minimum wage increase. Enrollment at four-year colleges is generally unchanged by minimum wage increases, and to the extent it is impacted it is a small, positive effect that quickly dissipates.

Attainment Impacts

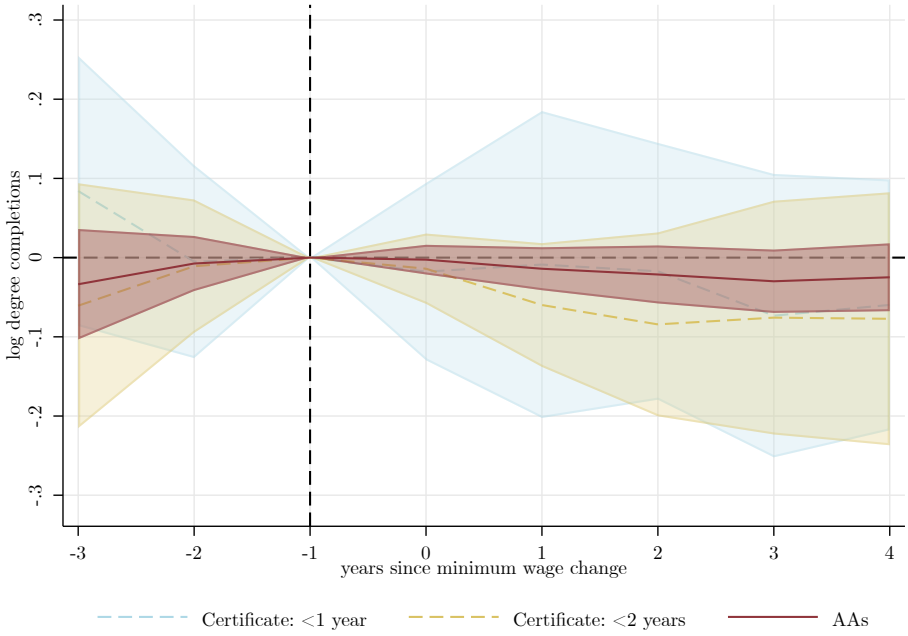
It is still an open question to what extent minimum wage changes alter program completions in two-year colleges. Many students who enter two-year colleges do not complete a program. On average, only 34% of incoming certificate and associate degree-seeking students at two-year institutions complete the credential within 150% of the predicted time to completion (for associate degree programs, three years); this completion rate is even lower—29%—at public two-year institutions (De Brey et al. 2021). To the extent that a minimum wage increase deters enrollment among students unlikely to complete their program, the impact on social benefits may be different than if it significantly reduces degree/certificate attainment.

Figure 4 investigates the impact of a relevant minimum wage increase on degree completion in two-year colleges, separately for certificate programs with duration of less than one year, duration of less than two years, and two-year associate (AA) degrees.[11] Despite the sizeable declines in enrollment at two-year colleges shown in the previous section, completions are unchanged. The results for AA degrees (in red) are precisely estimated and not statistically significant in both the pre- and post-periods. Completions of longer certificates ($<$ 2 years) and AA degrees trend down a little over time, but are never statistically significantly different from zero. Completions of shorter certificates ($<$ 1 year) are unchanged throughout the sample period. Attainment effects, similar to enrollment effects, do not appear to be sensitive to the size of the minimum wage change in terms of the 6%, 8%, and 10% thresholds used to classify events (see Appendix Figure A.6 for comparisons at the associate degree level.)

Figure 5 shows the impact of a minimum wage increase on attainment separately by gender. For women (panel A), there are no measured changes in the attainment of certificates, while there is a statistically

[11] Of all degree completions at two-year institutions in 2019, associate degree completions comprised approximately 56% of the total, whereas certificates of less than one year accounted for 27% and certificates of between one and two years accounted for 17% of the total (Authors' calculations).

Figure 4
Impact of minimum wage change (8%) on attainment



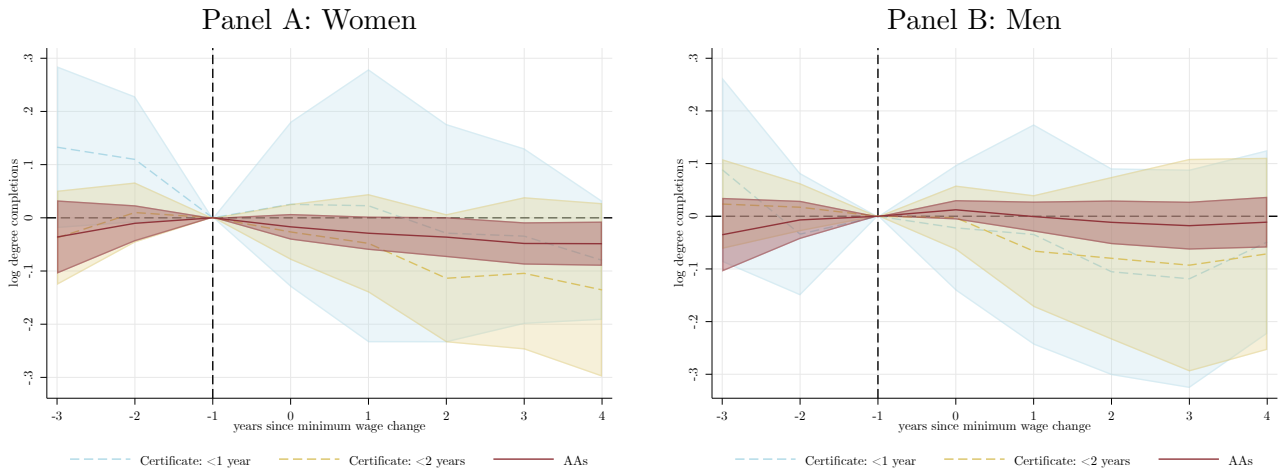
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on degree completions. The shaded region indicates 95% confidence intervals. Minimum wage changes are defined as an increase of 8% or more on the base. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. Red identifies changes in associate degree completion. Yellow identifies changes in completion of certificates that take longer than one year but fewer than two years to complete. Blue identifies changes in completion of certificates that take fewer than a year to complete. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

significant impact on AA degree several years after the policy change. The effect on AA degree attainment for women grows somewhat over time, consistent with the multi-year duration of these degrees, and is statistically significantly different from zero by the third year after a minimum wage increase with a magnitude of about 3%. For men (panel B), there is no measured impact on receipt of certificates or AA degrees. Results are similar when we conduct the analysis by race and gender, though there is an evident expansion of confidence intervals owing in part to fewer years of available data (Appendix Figures A.9 and A.10). While estimates are not precise, the data suggest that the negative effects on AA attainment are concentrated among White and Hispanic women.[12]

Beyond post-secondary credential attainment effects, a related hypothesis is that minimum wage changes may impact other types of adult training and skill development for low-wage workers. To this end, we attempted to explore the extent to which passing the General Educational Development Test (GED) or receiving training services under the federal workforce programs such as the Workforce Innovation and Opportunity Act (WIOA) were impacted. The limited availability of data on these outcomes produces

[12]We have also explored the extent to which degree effects may be concentrated in particular fields of study such as health sciences or business, and did not identify consistent or significant patterns. Results available on request.

Figure 5
Impact of minimum wage change (8%) on attainment



Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on degree completions. Panel A presents results for women at public institutions. Panel B presents the same estimates for men. he shaded region indicates 95% confidence intervals. Minimum wage changes are defined as an increase of 8% or more on the base. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. Red identifies changes in associate degree completion. Yellow identifies changes in completion of certificates that take longer than one year but fewer than two years to complete. Blue identifies changes in completion of certificates that take fewer than a year to complete. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage

imprecise estimates of effects for these outcomes (Appendix Table A.3). Effects on participation in WIOA appear to be limited to those in the "Youth" section of the program and only in the first year of treatment, with no discernable effects for the "Adult" or "Dislocated worker" sections of the program. For the GED, there is a decline of about 5.3% in the number of individuals taking the exam and an associated decline of 3.6% in the number of individuals who score high enough to "pass" the GED exam.

6 Mechanisms and Discussion

Analysis of the impact of state-level minimum wage changes on post-secondary enrollment and persistence produces convincing evidence of negative enrollment effects at community colleges, particularly among part-time students. Impacts on credential attainment are limited to a modest effect of women's receipt of degrees at the AA level. These enrollment estimates are quantitatively significant; using 8% as the magnitude of the minimum wage changes used in 1, our estimates suggest an overall community college enrollment elasticity of -0.575 and a part-time enrollment elasticity of -0.762. To provide context, most estimates of the tuition price elasticity of enrollment demand are more modest, with the recent study from Denning (2017) presenting an elasticity of -0.29 as the impact of tuition changes on community college enrollment among those who have just graduated from high school.

While there are a number of other labor market and post-secondary factors that impact community

college enrollment, large increases in the minimum wage over the last decade at the state and federal levels may be a contributing factor to the decline in aggregate community college enrollment evident over the last decade (from 7.2 million in 2010 to 4.7 million in 2020, Digest of Education Statistics Table 303.25).

Whether the decline in community college enrollment caused by increases in minimum wages ultimately hurts (or helps) workers depends on whether workers forgo skill attainment and how such skills would have been valued by the labor market. There is some evidence of modest economic returns to attendance and low levels of credit attainment even in the absence of degree attainment (Kane and Rouse 1995; Oreopoulos and Petronijevic 2013; Lovenheim and Smith 2022).

An interesting question raised by our evidence concerns how minimum wage changes and shifting participation in community college impact on-the-job training provided by firms. Essentially, are these activities complements or substitutes? In the context of canonical competitive labor market models, increasing the minimum wage reduces the firms' capacity to provide on-the-job training because firms can no longer finance the training through wage reductions given the minimum wage floor (Neumark and Wascher 2003). Alternatively, increasing the minimum wage in the presence of labor market frictions may generate incentives for firms to increase training, as firms are able to recoup some rents to the extent that the productivity gains from training exceed the firm's cost of providing the training (Acemoglu and Pischke 1999).

While we lack the data to measure the impact of minimum wage changes on training provided by firms, this open question is of first-order importance in evaluating the impact on the minimum wage on the skill-development of workers. A case where both community college enrollment and on-the-job-training fall with a rising minimum wage would point to a decline in training participation, while the case represented by an increase in firm-provided training would indicate a shift in "who pays" for training, shifting the burden from workers (through tuition) and the government (through grant and appropriation subsidies) to firms.

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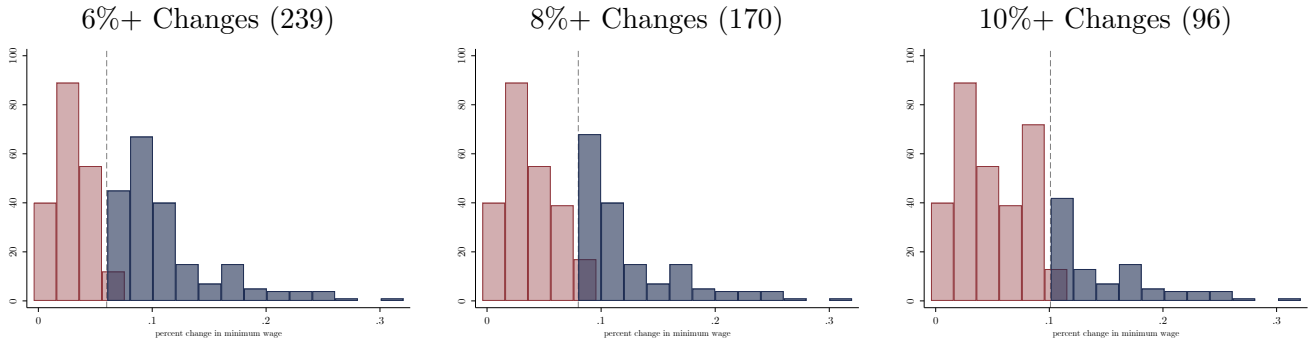
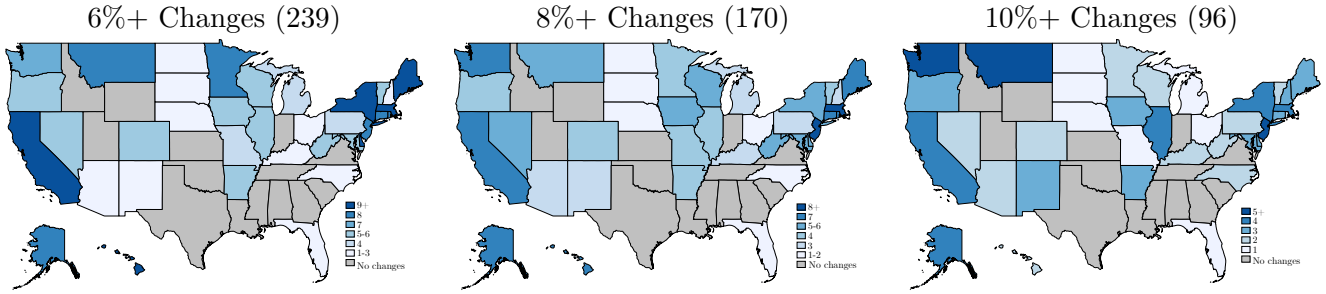
A Appendix

Figure A.1
Minimum Wage Change Histograms



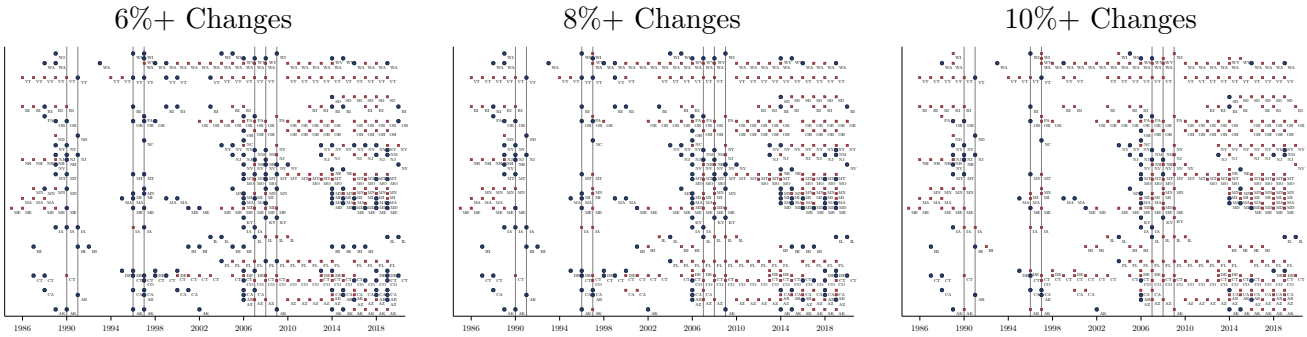
Notes: This figure shows a histogram of all minimum wage changes from 1986 to 2019. In each of the three panels, blue indicates relevant minimum wage changes, while red indicates minor minimum wage changes. The grey line indicates the given threshold (6%, 8%, or 10%). The total number of relevant changes above each threshold is given in parentheses: 239, 170, and 96.

Figure A.2
Minimum Wage Change Maps



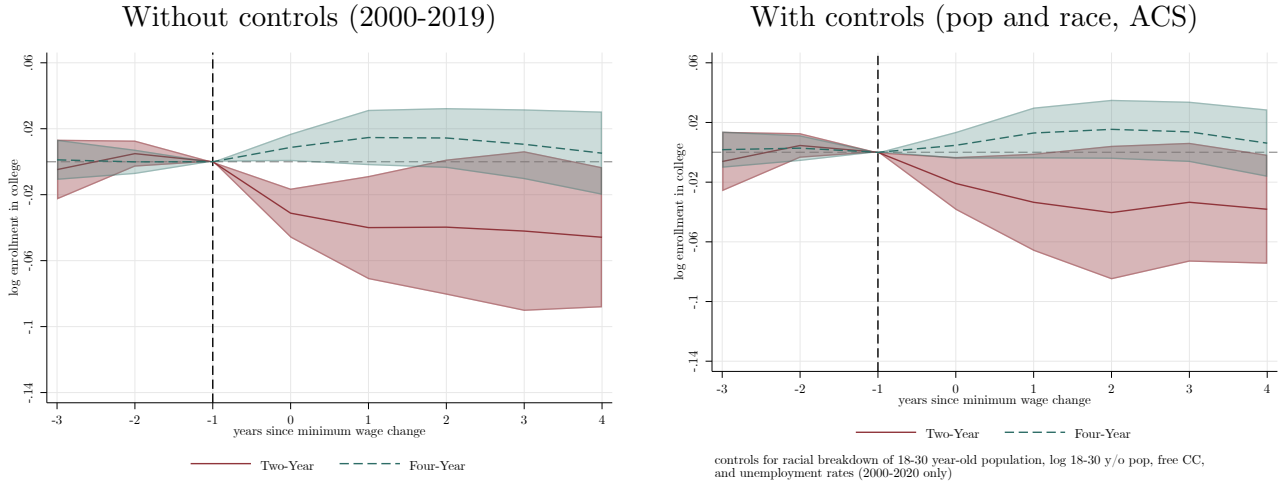
Notes: This figure shows a histogram of all minimum wage changes from 1986 to 2019. In each of the three panels, blue indicates relevant minimum wage changes, while red indicates minor minimum wage changes. The grey line indicates the given threshold (6%, 8%, or 10%). The total number of relevant changes above each threshold is given in parentheses: 239, 170, and 96.

Figure A.3
Minimum Wage Change Timelines



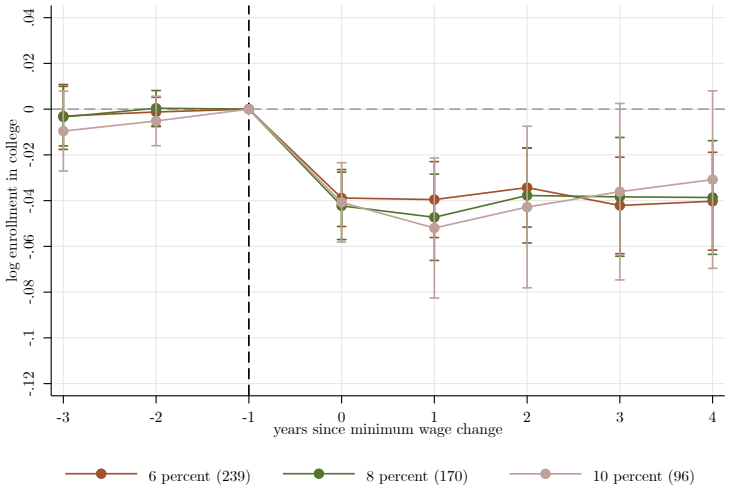
Notes: This figure shows a timeline of minimum wage changes from 1986 to 2019 across states in the US. Relevant minimum wage changes, defined by the given percent change in the minimum wage, are shown as blue circles, whereas red squares indicate minor minimum wage changes. Grey lines represent federal changes to the minimum wage.

Figure A.4
Main event study with ACS controls (2000-2010)



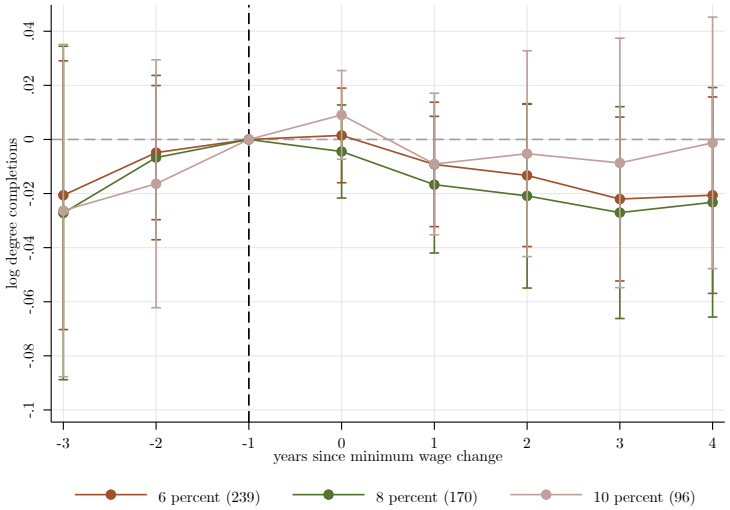
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on post-secondary enrollment. Panel A presents results using the traditional stacked event study. Panel B presents estimates from the stacked event study including controls for unemployment rate, free community college, log population (ages 18-30), and racial breakdown (percentages) of the 18-30 year-old population. Data from 2000-2019 are used. The shaded region indicates 95% confidence intervals. Minimum wage changes are defined as an increase of 8% or more on the base. Standard errors are clustered at the state level.

Figure A.5
Impact of minimum wage changes on two-year enrollment by change size



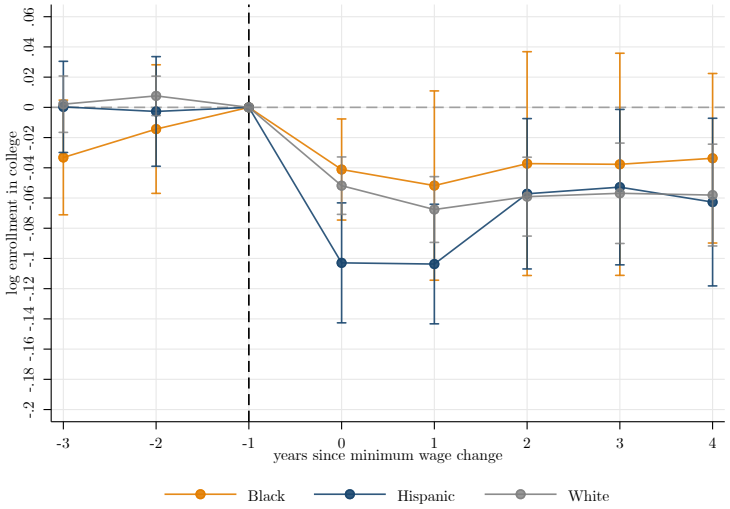
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in two-year colleges. Minimum wage change sizes of 6% or greater, 8% or greater, and 10% or greater are used. Whiskers indicate the 95% confidence interval. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

Figure A.6
Impact of minimum wage changes on associate degree completion by change size



Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on associate degree completion. Minimum wage change sizes of 6% or greater, 8% or greater, and 10% or greater are used. Whiskers indicate the 95% confidence interval. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

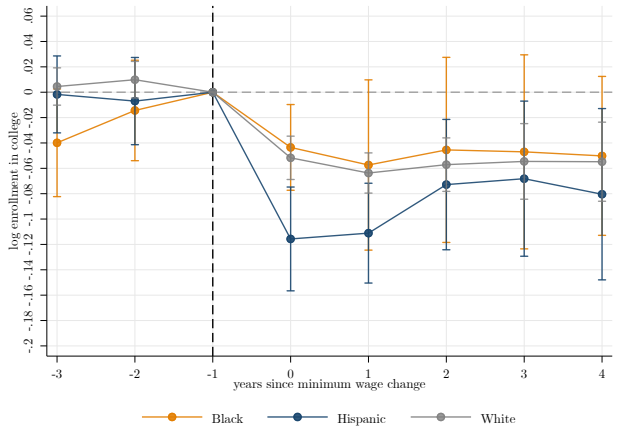
Figure A.7
Impact of minimum wage change (8%) on two-year enrollment by race/ethnicity



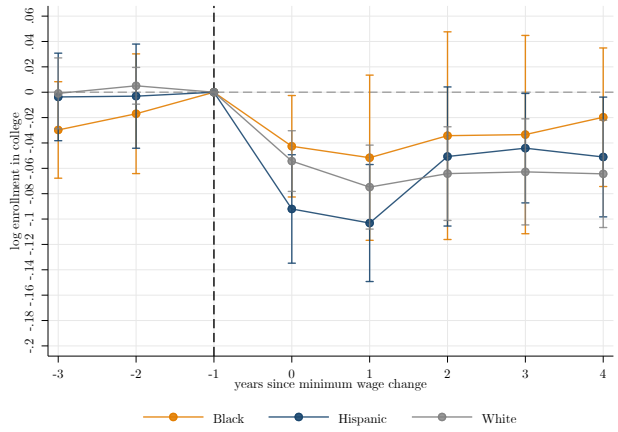
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in two-year colleges by race. Part-time and full-time enrollments are included. Whiskers indicate the 95% confidence interval. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level. Controls for unemployment rate and state population aged 18-30 are included. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

Figure A.8
Impact of minimum wage change (8%) on two-year enrollment by race/ethnicity and gender

Panel A: Female enrollment

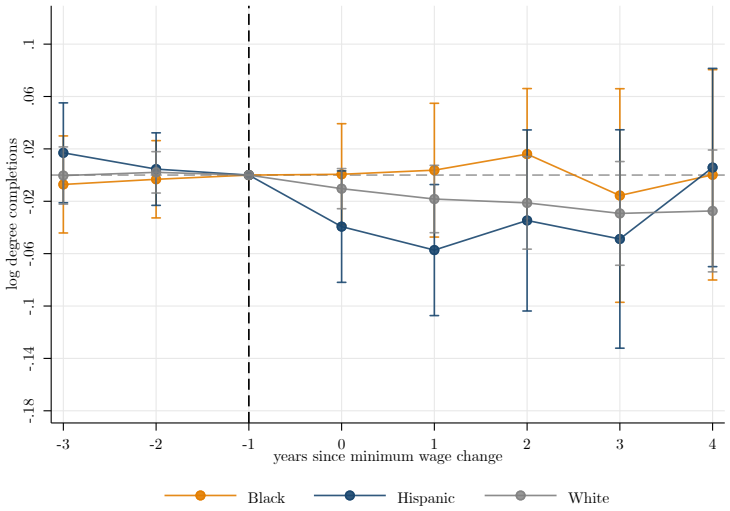


Panel B: Male enrollment



Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in two-year colleges by race. Panel A presents results for female enrollment in public institutions. Panel B presents results for male enrollment in public institutions. Race is coded by IPEDS. Part-time and full-time enrollments are included. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Whiskers indicate the 95% confidence interval. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

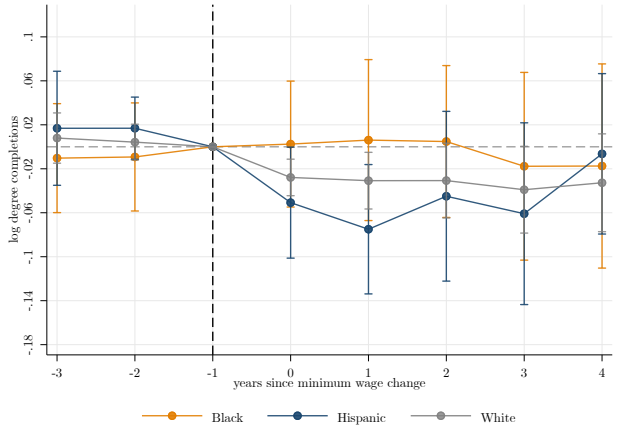
Figure A.9
Impact of minimum wage change (8%) on associate degree completions by race/ethnicity



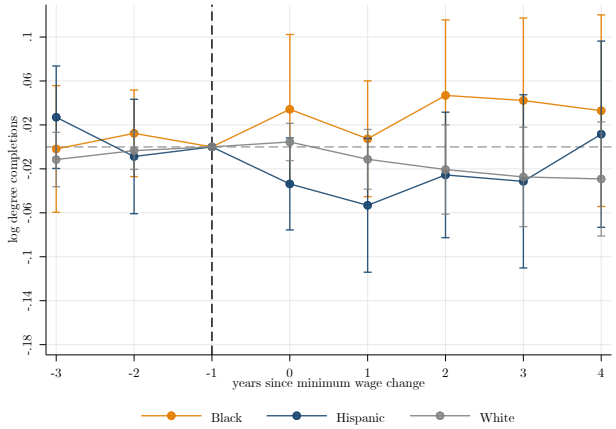
Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on completion of associate degrees at two-year colleges by race. Race is coded by IPEDS, and date from 1995-2019 are used. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Whiskers indicate the 95% confidence interval. he black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

Figure A.10
Impact of minimum wage change (8%) on AA completion by race/ethnicity and gender

Panel A: Female AA completions



Panel B: Male AA completions



Notes: This figure plots the results of a stacked event study measuring the impact of a state-level minimum wage increase on completion of associate degrees at two-year colleges by race and gender. Panel A presents results for female enrollments. Panel B presents results for male completions. Race is coded by IPEDS and data from 1995-2019 are used. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Whiskers indicate the 95% confidence interval. The black dashed line identifies the year before the change took place. Year 0 identifies the first academic year with an increased minimum wage.

Table A.1 – Impact of minimum wage change (8% or more) on two-year enrollment

	Total				Men				Women			
	Year t+0	Year t+1	Year t+2	Year t+3	Year t+0	Year t+1	Year t+2	Year t+3	Year t+0	Year t+1	Year t+2	Year t+3
	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(11)	(12)	(13)	(14)
Panel A: All Institutions												
Total enrollment	-0.043 ***	-0.056 ***	-0.043 ***	-0.043 ***	-0.041 ***	-0.057 ***	-0.043 ***	-0.043 ***	-0.046 ***	-0.057 ***	-0.044 ***	-0.045 ***
	(0.008)	(0.009)	(0.009)	(0.012)	(0.009)	(0.012)	(0.013)	(0.015)	(0.007)	(0.009)	(0.007)	(0.012)
Full-time enrollment	-0.016 **	-0.038 ***	-0.034 ***	-0.041 ***	-0.012	-0.033 ***	-0.027 ***	-0.034 ***	-0.018 **	-0.042 ***	-0.040 ***	-0.047 ***
	(0.008)	(0.012)	(0.010)	(0.013)	(0.007)	(0.012)	(0.010)	(0.013)	(0.009)	(0.013)	(0.010)	(0.014)
Part-time enrollment	-0.051 ***	-0.053 ***	-0.040 ***	-0.035 *	-0.056 ***	-0.062 ***	-0.047 **	-0.040 *	-0.050 ***	-0.049 ***	-0.037 ***	-0.034 *
	(0.010)	(0.014)	(0.013)	(0.020)	(0.014)	(0.020)	(0.020)	(0.024)	(0.009)	(0.011)	(0.010)	(0.019)
Panel B: Public Institutions												
Total enrollment	-0.042 ***	-0.052 ***	-0.046 ***	-0.043 ***	-0.046 ***	-0.060 ***	-0.052 ***	-0.048 ***	-0.040 ***	-0.048 ***	-0.042 ***	-0.041 ***
	(0.008)	(0.010)	(0.010)	(0.013)	(0.010)	(0.014)	(0.015)	(0.016)	(0.006)	(0.007)	(0.009)	(0.012)
Full-time enrollment	-0.009	-0.027 ***	-0.031 ***	-0.029 ***	-0.011	-0.029 ***	-0.030 ***	-0.027 **	-0.007	-0.028 ***	-0.035 ***	-0.033 ***
	(0.006)	(0.009)	(0.010)	(0.011)	(0.006)	(0.010)	(0.009)	(0.011)	(0.005)	(0.009)	(0.010)	(0.012)
Part-time enrollment	-0.063 ***	-0.068 ***	-0.058 ***	-0.054 ***	-0.071 ***	-0.082 ***	-0.072 ***	-0.064 ***	-0.059 ***	-0.060 ***	-0.051 ***	-0.048 ***
	(0.010)	(0.013)	(0.013)	(0.018)	(0.014)	(0.020)	(0.020)	(0.023)	(0.008)	(0.009)	(0.011)	(0.016)
Panel C: For-Profit Institutions												
Total enrollment	-0.085 *	-0.100	-0.096	-0.071	-0.100 **	-0.120	-0.094	-0.075	-0.079 *	-0.096	-0.112	-0.089
	(0.043)	(0.072)	(0.076)	(0.074)	(0.043)	(0.074)	(0.086)	(0.094)	(0.043)	(0.070)	(0.072)	(0.081)
Full-time enrollment	-0.042	-0.061	-0.084	-0.096	-0.040	-0.064	-0.064	-0.081	-0.042	-0.064	-0.110	-0.119 *
	(0.035)	(0.060)	(0.071)	(0.066)	(0.038)	(0.063)	(0.083)	(0.094)	(0.035)	(0.060)	(0.068)	(0.072)
Part-time enrollment	-0.178 **	-0.237 *	-0.190	-0.051	-0.166 **	-0.225 *	-0.152	-0.020	-0.237 ***	-0.302 **	-0.230	-0.103
	(0.079)	(0.138)	(0.165)	(0.182)	(0.075)	(0.127)	(0.131)	(0.127)	(0.086)	(0.141)	(0.151)	(0.171)

Notes: This table gives the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in public two-year colleges in the first four years after the change. Controls for unemployment rate and state population aged 18-30 are included. Standard errors are given in parentheses. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level.

Table A.2 – Impact of minimum wage change (8% or more) on four-year enrollment

	Total				Men				Women			
	Year t+0	Year t+1	Year t+2	Year t+3	Year t+0	Year t+1	Year t+2	Year t+3	Year t+0	Year t+1	Year t+2	Year t+3
	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(11)	(12)	(13)	(14)
Panel A: All Institutions												
Total enrollment	0.001	0.002	-0.006	-0.011	0.004	0.006	-0.002	-0.007	-0.001	-0.001	-0.009	-0.016
	(0.006)	(0.009)	(0.010)	(0.012)	(0.006)	(0.009)	(0.012)	(0.015)	(0.007)	(0.009)	(0.009)	(0.010)
Full-time enrollment	0.002	0.000	-0.004	-0.010	0.004	0.002	-0.003	-0.009	0.001	-0.001	-0.006	-0.012 *
	(0.004)	(0.006)	(0.006)	(0.006)	(0.004)	(0.006)	(0.007)	(0.008)	(0.004)	(0.006)	(0.006)	(0.006)
Part-time enrollment	-0.002	0.005	-0.011	-0.016	0.002	0.012	-0.002	-0.005	-0.005	-0.002	-0.020	-0.025
	(0.017)	(0.024)	(0.032)	(0.041)	(0.016)	(0.024)	(0.036)	(0.048)	(0.018)	(0.025)	(0.028)	(0.035)
Panel B: Public Institutions												
Total enrollment	0.008 **	0.008	0.006	0.000	0.010 **	0.010	0.006	0.000	0.006 *	0.007	0.005	-0.001
	(0.004)	(0.006)	(0.006)	(0.006)	(0.004)	(0.007)	(0.007)	(0.007)	(0.004)	(0.006)	(0.006)	(0.006)
Full-time enrollment	0.007 *	0.004	0.003	-0.001	0.008 **	0.005	0.002	-0.001	0.006 *	0.003	0.003	-0.002
	(0.003)	(0.005)	(0.007)	(0.006)	(0.004)	(0.006)	(0.007)	(0.007)	(0.003)	(0.005)	(0.006)	(0.006)
Part-time enrollment	0.015	0.029 **	0.018	0.009	0.015	0.028 **	0.014	0.004	0.016	0.029 **	0.020	0.012
	(0.010)	(0.013)	(0.015)	(0.016)	(0.010)	(0.014)	(0.015)	(0.015)	(0.010)	(0.014)	(0.016)	(0.019)
Panel C: For-Profit Institutions												
Total enrollment	0.042	0.045	-0.078	-0.147	0.018	0.136	0.056	0.021	0.035	0.003	-0.110	-0.226
	(0.088)	(0.131)	(0.251)	(0.275)	(0.081)	(0.134)	(0.274)	(0.282)	(0.093)	(0.141)	(0.251)	(0.282)
Full-time enrollment	0.094	0.113	0.027	-0.030	0.035	0.158	0.127	0.088	0.113	0.099	0.016	-0.071
	(0.098)	(0.132)	(0.210)	(0.238)	(0.087)	(0.140)	(0.224)	(0.233)	(0.101)	(0.139)	(0.215)	(0.249)
Part-time enrollment	-0.003	-0.010	-0.021	-0.168	-0.077	0.006	0.082	0.066	0.034	-0.001	-0.082	-0.312 *
	(0.102)	(0.102)	(0.114)	(0.180)	(0.073)	(0.097)	(0.128)	(0.130)	(0.088)	(0.109)	(0.124)	(0.183)

Notes: This table gives the results of a stacked event study measuring the impact of a state-level minimum wage increase on enrollment in public four-year colleges in the first four years after the change. Controls for unemployment rate and state population aged 18-30 are included. Standard errors are given in parentheses. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level.

Table A.3 – Impact of minimum wage change (8% or more) on WIOA and GED

	Year t+0 (1)	Year t+1 (2)	Year t+2 (3)	Year t+3 (4)
Panel A. WIOA Exiters				
Adults	-0.045	-0.044	0.121	0.127
	(0.102)	(0.113)	(0.123)	(0.133)
Youth	-0.050 *	-0.030	-0.028	-0.023
	(0.028)	(0.037)	(0.049)	(0.055)
Dislocated workers	0.055	0.084	0.123	0.087
	(0.050)	(0.067)	(0.102)	(0.111)
Panel B. GED Takers				
Completers	-0.053 **	-0.045 *	-0.009	-0.050
	(0.025)	(0.034)	(0.050)	(0.037)
Passers	-0.036 ***	-0.018	0.012	-0.029
	-(0.018)	(0.035)	(0.049)	(0.033)

Notes: This table gives the results of a stacked event study measuring the impact of a state-level minimum wage increase on completion of WIOA programs as well as completion and passing rates of GED exams. Standard errors are given in parentheses. Minimum wage changes are defined as an increase of 8% or more on the base minimum wage. Standard errors are clustered at the state level. GED data used are 1991-2013 and WIOA data are 2001-2019.