Labour Economics 100 (2026) 102884

Contents lists available at ScienceDirect

Labour Economics

journal homepage: www.elsevier.com/locate/labeco

The labor market effects of subminimum wage elimination: Evidence from a national analysis

Michelle Yin *, Regina Seo, Hoa Vu

School of Education and Social Policy, Northwestern University. 2120 Campus Dr, Evanston, IL 60208, USA

ARTICLE INFO

JEL classification:
H55
J14
J22
J71
J79

Keywords:
Subminimum wage
Disability employment
Labor market policy

ABSTRACT

This study examines the labor market effects of eliminating Section 14(c) subminimum wage employment laws for people with disabilities in the United States. We construct a novel panel dataset combining the universe of Department of Labor Section 14(c) administrative records (2015–2024) with individual-level data from the Current Population Survey (2009–2024). Exploiting the staggered elimination of Section 14(c) across fifteen states, we employ event-study and difference-in-differences designs to identify dynamic treatment effects. We find that elimination policies reduce formal subminimum wage employment by approximately 2000 workers per state within two years. Importantly, we find no statistically significant reductions in overall employment rates, competitive integrated employment, or hours worked among workers with disabilities. Estimates suggest economically meaningful reductions in welfare income receipt. These findings indicate that subminimum wage abolition achieves its intended policy objective by eliminating formal sheltered employment without imposing the adverse employment effects that critics of minimum wage policies predict. Our results inform ongoing federal deliberations over phasing out the Section 14(c) program.

1. Introduction

Section 14(c) of the Fair Labor Standards Act (FLSA) of 1938 has allowed employers to pay people with disabilities (PWD) less than the statutory minimum wage for over eight decades via special certificates from the U.S. Department of Labor. This provision was originally intended to encourage the employment of PWD by permitting wage flexibility for individuals with lower measured productivity (Department of Labor, 2008). In 2016, approximately 220,000 workers were employed under Section 14(c) certificates. Although this number has declined substantially over time, in 2024, approximately 40,000 workers with disabilities were still employed in subminimum wage settings (Department of Labor, 2024). Proponents of subminimum wage employment (SWE) argue that it provides essential employment opportunities for individuals who might otherwise struggle to enter the workforce (Bourne and Subramaniam, 2021), cautioning that eliminating subminimum wages could lead to job losses for PWD and greater dependence on public assistance. Critics, however, content that SWE discourages skill development, limits labor market opportunities, and perpetuates dependency on sheltered work settings (Crandell, 2022; U.S. Commission on Civil Rights, 2020).

Empirical evidence lends support to the critics' perspective: PWD employed under 14(c) face higher poverty rates (Maroto and Pettinicchio, 2023) and may impose greater fiscal costs on taxpayers compared to supporting competitive, integrated employment (CIE) (Cimera, 2000). SWE may also reduce employer incentives to invest in productivity-enhancing training and workplace accommodations, reinforcing low-wage employment patterns (Crandell, 2022). This practice contributes to persistent wage gaps between individuals with and without disabilities (Yin et al., 2014) and increases reliance on public assistance programs such as SSI and SSDI, as low earnings fail to provide sufficient financial stability (Maroto and Pettinicchio, 2023). For example, the employment-to-population ratio for PWD was just 22.5%, compared to 65.8% for those without disabilities, and the unemployment rate for PWD (7.2%) was more than double that of those without disabilities (3.5%) in 2023 (Bureau of Labor Statistics, 2024).

In response to these concerns and ongoing policy debates, a growing number of U.S. states have taken action to phase out subminimum wages for PWD. Vermont was the first state to do so in 2002, transitioning affected workers into competitive employment through partnerships with the University of Vermont (Dague, 2018). New Hampshire followed in 2015, becoming the first state to eliminate subminimum wages

* Corresponding author.
E-mail addresses: michelle.yin@northwestern.edu (M. Yin), regina.seo@northwestern.edu (R. Seo), hoa.vu@northwestern.edu (H. Vu).

https://doi.org/10.1016/j.labeco.2026.102884
Received 20 February 2025; Received in revised form 25 March 2026; Accepted 29 March 2026
Available online 30 March 2026

through state legislation. Alaska subsequently phased out subminimum wages through a two-step process: first via regulation in 2018 and then through legislation enacted in 2022. Since then, additional states including Maryland, Maine, Washington, Hawaii, Rhode Island, and Tennessee have passed similar measures. As of July 2023, fifteen states had enacted restrictions or full eliminations of subminimum wage employment (Association of People Supporting Employment First, 2023). In December 2024, the U.S. Department of Labor signaled a potential shift in federal policy by proposing a rule to cease issuing new 14(c) certificates and eventually phase out the program. However, in July 2025, the Department formally withdrew the proposed rule, leaving the federal 14(c) program in place and halting movement toward a nationwide phaseout (U.S. Department of Labor, 2025).

Despite this momentum, the labor market effects of eliminating subminimum wage for PWD remain uncertain. On one hand, ending SWE could improve wages and encourage labor force participation among PWD; on the other, it might reduce employment opportunities for those with very low productivity if employers are unwilling to hire them at or above the standard minimum wage. This study seeks to resolve this ambiguity by providing empirical evidence on the effects of SWE elimination. We contribute to three strands of literature in labor economics and disability policy. First, it extends the body of research on general minimum wage laws to a new context. Reviews of the "New Minimum Wage Research," characterized by robust econometric methodologies and richer datasets, has generated mixed findings on employment: Neumark and Shirley (2022) highlight negative employment effects, particularly for teenagers, young adults, and less educated workers, while Dube and Zipperer (2024) find modestly positive to negligible employment impacts. Nonetheless, there is broad consensus that raising the minimum wage increases hourly earnings and compresses lower-tail wage inequality (Autor et al., 2016; Cengiz et al., 2019; Derenoncourt and Montialoux, 2021). Our analysis focuses on a targeted wage floor increase for a particularly vulnerable group, thereby enriching the minimum wage literature with evidence from the disability employment context.

Second, our work contributes to the limited literature on minimum wage policies and the employment of PWD. Existing research is limited, and findings vary. Kim et al. (2025) find essentially no employment effect of minimum wage increases on participants in the federal AbilityOne program which employs PWD in subsidized jobs, whereas Clemens et al. (2025) document negative employment effects and increased reliance on public assistance among individuals with severe disabilities following large minimum wage hikes in the 2010s. By examining the abolition of subminimum wages laws, our study provides new insights into how a more targeted wage policy might differentially affect the labor outcomes of PWD.

Third, we add to the nascent literature specifically addressing subminimum wage employment. Previous research on subminimum wages has often centered on wage evasion practices for the general population (Clemens and Strain, 2022a, 2022b). Within disability-focused literature, the 14(c) program has been widely criticized for perpetuating economic disparities and dependence on sheltered workshops (Crandell, 2022; Maroto and Pettinicchio, 2023), but until recently there was little empirical evidence on the consequences of ending the program. To our knowledge, only one empirical study directly examines SWE repeal: Kakara et al. (2024), using ACS data, find employment gains for individuals with cognitive disabilities in New Hampshire, but no such effects in Maryland. However, the data they use lack accurate hourly wages and does not identify 14(c) workers, constraining inference on subminimum wage employment. Robust evidence from other states remains scarce, limiting broader policy conclusions.

This study addresses this gap by providing the first national-level quasi-experimental analysis of the labor market effects of abolishing subminimum wage laws. Our empirical strategy combines multiple data sources to overcome measurement challenges that have constrained prior research. Through a Freedom of Information Act (FOIA) request to the U.S. Department of Labor (DOL)'s Wage and Hour Division, we obtained comprehensive administrative data on Section 14(c) certificate holders, including the universe of approximately 1500–2000 employers annually authorized to pay subminimum wages. This administrative dataset, containing validated employment counts from official DOL records over nine years (2015–2024), enables the first precise identification of formal sheltered employment that survey data cannot distinguish from other low-wage work. We link these administrative records with Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) and Outgoing Rotation Group (ORG) data spanning 2009–2024, creating a panel that tracks both policy-targeted 14(c) employment and broader labor market outcomes. Exploiting the staggered timing of SWE elimination across fifteen states, we employ event study and difference-in-differences (DID) designs to identify causal effects while accounting for state-specific trends and time-varying confounders.

Our findings show that eliminating subminimum wage laws has significantly reduced the number of PWD employed under Section 14(c), by roughly 2000 employees on average per state within two years of the policy change. These state efforts have effectively curtailed the formal use of subminimum wages under 14(c). Crucially, we find no evidence that SWE caused overall employment of PWD to decline. There are no statistically significant impacts on PWD's aggregate employment rate, hours worked, or hourly wages in the short run following the policy. We argue this is not because the policy was ineffective, but because the 14(c) population, while vulnerable, is small relative to the total PWD population, and transition barriers such as search costs remain high. In addition, workers may have transitioned to low-margin competitive arrangements—such as social enterprises or supported employment enclaves—that pay the statutory minimum. While these roles are legally compliant, they often represent a lateral financial move rather than a significant wage increase. Notably, while hourly wage effects are imprecise, our DID estimates suggest positive effects on annual wage income, though event study estimates for this outcome are noisy and should be interpreted with caution. Moreover, we find suggestive evidence of reduced reliance on welfare income, indicating that SWE elimination does not increase dependency on public assistance and may, in fact, promote greater economic self-sufficiency among PWD.

2. Background on elimination of subminimum wage employment

The Section 14(c) Certificate System. Section 14(c) of the Fair Labor Standards Act authorizes employers to pay workers with disabilities below the federal minimum wage, but only after obtaining certificates from the U.S. Department of Labor's Wage and Hour Division. To receive a certificate, employers must: (1) identify the prevailing wage rate paid to experienced workers without disabilities performing essentially the same type, quality, and quantity of work in the vicinity, typically through a prevailing wage survey; (2) determine the productivity standard for experienced workers without disabilities against which the productivity of the worker with disabilities must be measured; and (3) assess the quality and quantity of the productivity of the worker with a disability through time studies and work measurements. These productivity assessments are foundational to the case for paying subminimum wages and must be updated periodically to reflect any changes or improvements in worker productivity. At a minimum, the wages of hourly paid workers must be reviewed every six months, and wages for all workers must be adjusted at least annually to reflect changes in prevailing wages (Office of the Federal Register, 2024). DOL's processing times for these applications have ranged from 2 days to over 2 years, with about 40 percent completed within 4 months, based on data from 2019 through 2021. The resulting wage distribution shows considerable variation: administrative data indicate that nearly half of workers under 14(c) certificates earned less than $3.50 per hour, approximately 10 percent earned $1.00 or less, and nearly 2 percent

earned $0.25 or less per hour. These low wage levels reflect the application of productivity-based formulas to workers whose measured output ranges from minimal to near-standard productivity levels (Office of the Federal Register, 2024).

State-Level Elimination Efforts. Over the past decade, a growing number of U.S. states have taken action to eliminate subminimum wages, reflecting a broader national movement toward CIE. Vermont was the first state to eliminate subminimum wage employment through administrative reform rather than legislation. The process began with the 1993 closure of Brandon Training School and was formalized by the 1996 Developmental Disabilities Act, which prioritized individualized, community-based services (Dague et al., 2023). Vermont ended funding for new sheltered workshops in 2000 and closed its last one in 2002, making it the first state to stop using 14(c) certificates entirely. We exclude Vermont from our analysis because Vermont's elimination preceded our administrative data, which begins in 2015, and represents a unique early case with fundamentally different implementation characteristics.

Table 1 lists the states included in our analysis and the corresponding legislation or administrative announcements that provide clear-cut policy guidance on eliminating subminimum wages. These states employed two distinct approaches. The first group, including Alaska, Hawaii, Maine, Rhode Island, South Carolina, Tennessee, and New Hampshire, implemented immediate or near-immediate bans. For instance, Alaska issued Public Announcement No 18–04 on February 16, 2018, which took immediate effect and discontinued the state's use of 14 (c) certificates. New Hampshire's law prohibited employers from paying individuals with disabilities below the minimum wage and became effective 60 days after passage. However, consistent with federal enforcement practices, employers who already held valid 14(c) certificates at the time of enactment were permitted to continue using them until expiration (typically two years), though they could not apply for renewals or new certificates.

The second group adopted more gradual approaches with delayed implementation timelines or transition requirements. California's SB-639, enacted in 2021, prohibited new 14(c) certificates starting in 2022 with full elimination scheduled for January 1, 2025. Similarly, Colorado's SB-39 and Nevada's AB-259 require employers to develop transition plans, with SWE scheduled to end in 2025 and 2028, respectively. Maryland and Oregon halted new certificate issuance early while allowing existing holders several years to comply. Virginia's HB-1924, enacted in 2023, outlines the longest timeline with full elimination scheduled for July 1, 2030. These policies reflect a diverse set of institutional pathways toward eliminating subminimum wage employment for people with disabilities.

Table 1
State legislations to eliminate subminimum wage employment.

State	Bill No.	Enacted date	Effective date
Alaska	Public announcement No.18–04	2/16/2018	2/16/2018
California	2021 SB-639	9/27/2021	1/1/2025
Colorado	2021 SB-39	6/29/2021	7/1/2025
Delaware	2021 HB-122	10/20/2021	1/31/2024
Hawaii	2021 SB-793	6/21/2021	6/21/2021
Maine	2020 LD-1874	3/17/2020	3/17/2020
Maryland	2016 SB-417	5/19/2016	10/1/2020
Nevada	2023 AB-259	6/16/2023	1/1/2028
New Hampshire	2015 SB-47	5/11/2015	7/6/2015
Oregon	2019 SB-494	6/21/2019	7/1/2023
Rhode Island	2022 HB-7511	6/15/2022	6/15/2022
South Carolina	2021 S-553	6/1/2022	1/1/2023
Tennessee	2022 SB-2042	4/26/2022	7/1/2022
Virginia	2023 HB-1924	4/12/2023	7/1/2030
Washington	2021 SB-5284	4/16/2021	7/25/2021

3. Conceptual framework

The elimination of SWE laws can affect the labor market outcomes of PWD through multiple channels. To guide our empirical analysis, we develop a conceptual framework that formalizes how raising the wage floor may influence both labor supply and labor demand. We model the decision-making process of a PWD using a utility function $U(c,l)$, where c denotes consumption and l denotes leisure. Marginal utilities are positive: $\partial U/\partial c \geq 0$ and $\partial U/\partial l \geq 0$.

For simplicity, we assume that an individual either works one unit of time ($h = 1$) or does not work ($h = 0$). If the individual does not work, they receive the maximum benefit from income-tested programs, and consume and enjoy full leisure: $c_0 = b(0)$ and $l_0 = 1$.

If the individual works, they earn wage income w, but transfer income phases out according to a decreasing function $b(w)$, with $b'(w) < 0$. They also incur a participation or entry cost $e(w)$, which captures job search effort, transportation, accommodation needs, or the costs of transitioning from sheltered work to competitive integrated employment. Allowing $e(w)$ to depend on the wage ($e'(w) > 0$) reflects that higher mandated wages may make job opportunities harder to secure, because fewer employers hire at the higher wage, which in turn raises the search or adjustment costs borne by workers. Thus, $c_1 = w + b(w) - e(w)$ and $l_1 = 0$. The individual chooses to work if:

$$U(w + b(w) - e(w), 0) \geq U(b(0), 1) \tag{1}$$

and not to work otherwise.

We also incorporate a labor demand constraint. Suppose firms hire workers only if expected productivity p is at least as high as the wage: $p \geq w$. When SWE is eliminated and the wage floor rises, some employers may no longer be willing to hire workers they perceive to be less productive. We model this with $D(w)$, the probability that a job is available at wage w, where $D'(w) < 0$. Thus, employment is only feasible if both the utility condition (1) is satisfied and a job is available: $D(w) > 0$.

To characterize how changes in the wage affect the worker's incentive to work, we differentiate the working utility condition with respect to w:

$$U_c(1 + b'(w) - e'(w)) \geq 0 \tag{2}$$

The sign of $1 + b'(w) - e'(w)$ is ambiguous and reflects three economic forces: the substitution effect, the income and benefit phase-out effects, and labor-market-related effects arising from both job scarcity and wage-dependent participation costs.

Substitution Effect. The term "1" in (2) captures the substitution effect: when the wage increases, each additional dollar directly raises consumption from working by one unit (before accounting for benefit phase-outs or participation costs). This increase in the marginal reward to working raises the relative value of labor over leisure and pushes the net marginal utility upward, increasing the incentive to work.

Income and Benefit Phase-Out Effects. The term $b'(w) < 0$ reflects the interaction of wage increases with income-tested benefits. Because benefit income declines as earnings rise, part of a wage increase is offset by lost transfers. In addition, because leisure is typically a normal good, higher wages may generate income effects that reduce labor supply: individuals may reach a target income level with less work and choose more leisure. These forces dampen the labor supply response to higher wages and may offset part of the substitution effect.

Labor Market Effect. The labor market effect arises through two components of the model:

1. Search costs, $e(w)$ with $e'(w) > 0$. If higher mandated wages reduce the number of suitable job openings, because some employers cannot profitably hire PWD at the higher wage, search effort, training, or adjustment costs may rise. This appears directly in (2) through the term $-e'(w)$, lowering the net gain from work.

2. Job availability, $D(w)$, with $D'(w) < 0$. Although $D(w)$ does not enter (2) mechanically, it determines whether employment is feasible. A reduction in $D(w)$ lowers the probability of receiving a job offer and may prevent individuals from working even when employment would yield higher utility. Diminished job opportunities amplify the impact of rising participation costs.

Empirical evidence supports the mechanisms highlighted in the model. If higher wage floors compress job availability or raise participation costs, employers may adjust on non-wage margins in ways that effectively increase search or training burdens for workers with disabilities. Consistent with this, Kim et al. (2025) find that participants in the federal AbilityOne program experience reductions in fringe benefits when state minimum wages increase, indicating that employers respond to binding wage floors by altering job attributes rather than expanding opportunities. Likewise, Clemens (2021) documents that employers commonly adjust along job duties, training requirements, and benefits when mandated wages rise. These findings underscore how reductions in suitable openings (lower $D(w)$) and increases in effective participation costs (higher $e(w)$) manifest in practice, reinforcing the channels through which SWE elimination may affect labor market outcomes for PWD.

Overall Impact and the Role of Frictions. The overall theoretical effect of SWE elimination on employment of PWD is indeterminate ex ante. Higher wages can incentivize work, but reduced benefits and income effects may discourage it. Rising participation costs and reduced job availability can prevent willing workers from obtaining employment. In a competitive labor market, a binding wage floor typically reduces employment for workers whose productivity is below the mandated wage. However, if the labor market for PWD exhibits monopsonistic features—such as sheltered workshops or certain service providers exerting wage-setting power—raising the wage floor may increase wages and employment. Under classical monopsony, increasing the wage floor toward the competitive level can raise both wages and employment for an underpaid group.

Informational frictions also matter. Employers may have limited information about the productivity of PWD or hold biases. When allowed to pay very low wages under SWE, employers may have used jobs as a screening mechanism; with the removal of SWE, employers may become more cautious, amplifying negative demand effects. Conversely, eliminating extremely low wages may encourage investment in training or accommodations, improving productivity and mitigating job losses over time.

In summary, SWE elimination guarantees higher wages for those who remain employed, but whether it increases or decreases employment among PWD depends on the relative strength of these opposing forces. The presence of benefit phase-outs, heterogeneous productivity, wage-dependent participation costs, and employer responses makes the theoretical prediction ambiguous, underscoring the need for empirical analysis.

4. Data

To identify the causal effects of eliminating SWE, we construct a novel panel dataset combining administrative records from the U.S. Department of Labor with individual-level survey data. Our analysis covers the period 2009–2024 for survey measures, and 2015–2024 for administrative data.

4.1. Department of Labor 14(c) certificate holder data

Our primary data contribution is the use of administrative records from the Department of Labor's Wage and Hour Division on employers holding 14(c) certificates from 2015 through 2024. To our knowledge, these records have rarely been used in academic research, though they have been incorporated in past government reports. The dataset provides the universe of formally authorized subminimum wage employers during this period, including information on certificate holders, their locations, and the number of workers paid subminimum wages under each certificate. From these administrative records, we construct state-level counts of 14(c) workers and active 14(c) certificates (employers) for each year. This allows us to directly measure whether state elimination policies reduced the size of the formal 14(c) subminimum wage workforce—the exact policy target that cannot be identified from survey data alone. Prior research has been unable to distinguish between workers in formal sheltered employment (14(c)) and those earning low wages in other contexts (tipped work, piece-rate employment, or wage non-compliance). Our administrative data resolves this measurement problem by providing objective counts of the specific employment arrangement targeted by state policies.

4.2. Current population survey (CPS)

To measure broader labor market outcomes beyond formal 14(c) employment, we use the CPS, a monthly nationally representative survey jointly conducted by the U.S. Census Bureau and the Bureau of Labor Statistics. Since 2008, the CPS has included six questions to identify disability status, covering difficulties in hearing, vision, cognition, mobility, self-care, and independent living. We draw on both the CPS Annual Social and Economic Supplement (ASEC) and the Outgoing Rotation Group (ORG) files.

The ASEC provides detailed annual information on income, employment, and demographic characteristics. From the CPS-ASEC, we construct annual measures of wage and salary income, welfare income, employment status, competitive integrated employment status (CIE), and hours worked per week. We define CIE as employment where the individual: (i) earns at or above the minimum wage, (ii) is enrolled in a workplace pension plan, (iii) holds a position offering insurance coverage, or (iv) is entitled to paid time off—distinguishing competitive employment from sheltered workshops. CPS-ASEC also serves as the primary source for our descriptive analysis of demographic and labor market characteristics by disability status.

To measure hourly wages with the highest accuracy available in survey data, we rely on the CPS-ORG, which directly reports hourly pay for workers paid by the hour and allows hourly wage imputation for salaried workers by dividing usual weekly earnings by usual weekly hours, following standard practice (Autor et al., 2016). We classify respondents as receiving subminimum wages if their reported hourly earnings fall below the effective state or federal minimum wage. The CPS-ORG is the canonical data source for minimum wage research (e.g., Autor et al., 2016; Bernstein and Mishel, 1997; Card, 1992; Cengiz et al., 2019; Clemens and Strain, 2023) and provides substantially more precise wage measurement than annual income data in the ASEC.[1]

The combination of administrative and survey data provides important analytical advantages, as the two sources complement each other. Administrative 14(c) records provide the universe of formally authorized subminimum wage employers and thus offer a precise count of the policy target of formal 14(c) employment while the CPS captures the full spectrum of labor market outcomes, including competitive employment and transitions out of sheltered work. The administrative data represent a lower bound on subminimum wage employment, as CPS respondents may report below-minimum wages for reasons unrelated to 14(c), including tipped work, piece-rate arrangements, informal employment, or reporting error. By merging these data at the state-year level, we are able to test both the mechanical first-stage effect of policy changes on 14(c) certificates and the broader spillover effects on labor market outcomes for people with disabilities.

[1] For both annual income and hourly wages, we keep individuals with non-zero income and adjust the income to 2019 dollars using CPI data. After normalization, we take the natural logarithm.

4.3. Sample construction and restrictions

Following Autor, Manning, and Smith (2016), we restrict analysis to working-age adults (ages 16–64), excluding self-employed and unpaid family workers where minimum wage laws typically do not apply. We exclude Vermont, which eliminated 14(c) prior to our study period, and Texas and Illinois, which adopted targeted state-contract reforms rather than comprehensive 14(c) eliminations.[2]

4.4. Descriptive statistics

Baseline Disparities by Disability Status. Table 2 presents summary statistics for the working-age population, stratified by disability status (none, single, and multiple) from CPS-ASEC. Approximately 7.8% reports a disability, with 4.5% reporting a single disability and 3.3% multiple disabilities. On average, PWD are older, less likely to be married, and overrepresented among non-Hispanic White and Black populations. PWD, particularly those with multiple disabilities, experience significant disparities in education and economic outcomes. They are more likely to have a high school or less education and are less likely to hold a bachelor's degree or higher. Labor market disparities are stark. Individuals with one disability participate at approximately 58% the rate of those without disabilities (calculated as 0.46/0.79), and for those with multiple disabilities, the rate drops to 22% (calculated as 0.17/0.79). Among those in the labor force, PWD have lower employment rates, higher unemployment rates, and work fewer hours. Income disparities mirror these patterns: individuals with one disability earn, on average, less than half the income of those without disabilities, while those with multiple disabilities earn about 15%. Social Security Income comprises approximately 11% of total income for those with one disability and 28% for those with multiple disabilities.

Characteristics of the SWE Population. Table 3 compares the characteristics of workers with disabilities earning subminimum wages using CPS-ORG to those earning at or above the statutory minimum. Between 2009 and 2024, a total of 3026 individuals with disabilities in our sample reported earning subminimum hourly wages, compared to 56,054 individuals with disabilities earning at or above the minimum wage. Workers in SWE are significantly younger (average age 37 vs. 44), less educated (21% have less than a high school degree vs. 11%), and substantially more likely to report cognitive, self-care, or independent living difficulties. Most notably, they are 10 percentage points more likely to report multiple disabilities (32% vs. 22%). Those in SWE work an average of 9.6 fewer hours per week and earn substantially less: weekly earnings of $252 versus $621, and hourly wages of $7.51 versus $17.15. Additionally, workers in SWE are 8 percentage points less likely to be union members or covered by union protections and 8 percentage points more likely to hold roles that included overtime, tips, or commissions. These characteristics identify the SWE population as distinct even from the broader workforce of people with disabilities, they represent the subgroup with the highest barriers to competitive employment.

Trends in the Formal 14(c) Sector (Administrative Evidence). Trends in the administrative data reveal that the Section 14(c) program was contracting significantly even prior to the implementation of many state bans. Fig. 1 displays the national universe of Section 14(c) activity. We observe a massive secular decline: the number of workers employed under 14(c) certificates fell by approximately 80%, from 201,906 in 2015 to 40,579 in 2024. Similarly, the stock of active employer certificates dropped by 63% from 2088 to 748) over the same period. Crucially, Fig. 2 disaggregates this decline by state policy status. It reveals that while 14(c) usage is declining secularly even in states with no legislative bans (the "No law change" trend), the states implementing

Table 2
Characteristics of working age individuals by disability status.

	No disability	One disability	Multiple disabilities
Demographic Characteristics			
Female	0.51	0.49	0.52
Age	40.14	46.86	48.19
Married	0.53	0.42	0.33
Non-Hispanic White	0.61	0.67	0.63
Non-Hispanic Black	0.12	0.15	0.18
Hispanic	0.18	0.13	0.13
Educational Attainment			
Less than HS degree	0.14	0.16	0.22
HS degree or GED	0.28	0.36	0.39
Some college or associate's	0.29	0.30	0.27
Bachelor's degree or higher	0.33	0.17	0.12
Labor Market Characteristics			
In labor force	0.79	0.46	0.17
Employed*	0.94	0.88	0.86
Unemployed*	0.06	0.12	0.14
Usual weekly work hours*	39.84	37.98	33.19
Income			
Total personal income	$ 45,737	$ 28,319	$ 17,842
Wage and salary income	$ 39,435	$ 18,254	$ 5773
Social security income	$ 446	$ 3066	$ 5041
N	1535,774	71,114	52,389

Data source: Current Population Survey Annual Social and Economic Supplement (ASEC), 2009–2024.

* Notes: Employment and unemployment rates are conditional on being in the labor force, and usual weekly work hours are conditional on being employed.

Table 3
Characteristics of workers with disabilities by subminimum wage employment status.

	In SWE	Not in SWE	Difference
Demographic Characteristics			
Female	0.55	0.50	0.05
Age	37.44	44.27	−6.83
Married	0.20	0.41	−0.21
Non-Hispanic White	0.65	0.73	−0.09
Non-Hispanic Black	0.13	0.10	0.04
Hispanic	0.15	0.11	0.04
Educational Attainment			
Less than HS degree	0.21	0.11	0.10
HS degree or GED	0.42	0.38	0.05
Some college or associate's	0.30	0.36	−0.07
Bachelor's degree or higher	0.07	0.15	−0.08
Disability Type			
Hearing	0.18	0.30	−0.12
Vision	0.14	0.16	−0.02
Cognitive	0.53	0.33	0.20
Mobility	0.28	0.34	−0.07
Independent living	0.26	0.13	0.13
Self-care	0.06	0.05	0.01
Multiple types of disability	0.32	0.22	0.10
Labor Market Characteristics			
Usual weekly work hours	25.87	35.43	−9.64
Weekly earnings	$ 252.3	$ 621.2	-$ 369.0
Hourly wage	$ 7.51	$ 17.15	-$ 9.64
Member of or covered by union	0.05	0.13	−0.08
Receives overtime, tips, or commissions	0.23	0.15	0.08
N	3026	56,054	

Data source: Current Population Survey Outgoing Rotation Group (ORG) Earnings Data, 2009–2024.
Notes: All differences are statistically significant at the 1% level.

[2] State use contracts are agreements where state governments procure goods or services from entities that employ people with disabilities, often at subminimum wages. If these states have eliminated subminimum wages within these contracts, it introduces a unique context or policy environment that could confound the analysis. Including such states might make it harder to isolate the effects of broader subminimum wage elimination policies, as their labor market conditions are influenced by these specific state-level reforms.

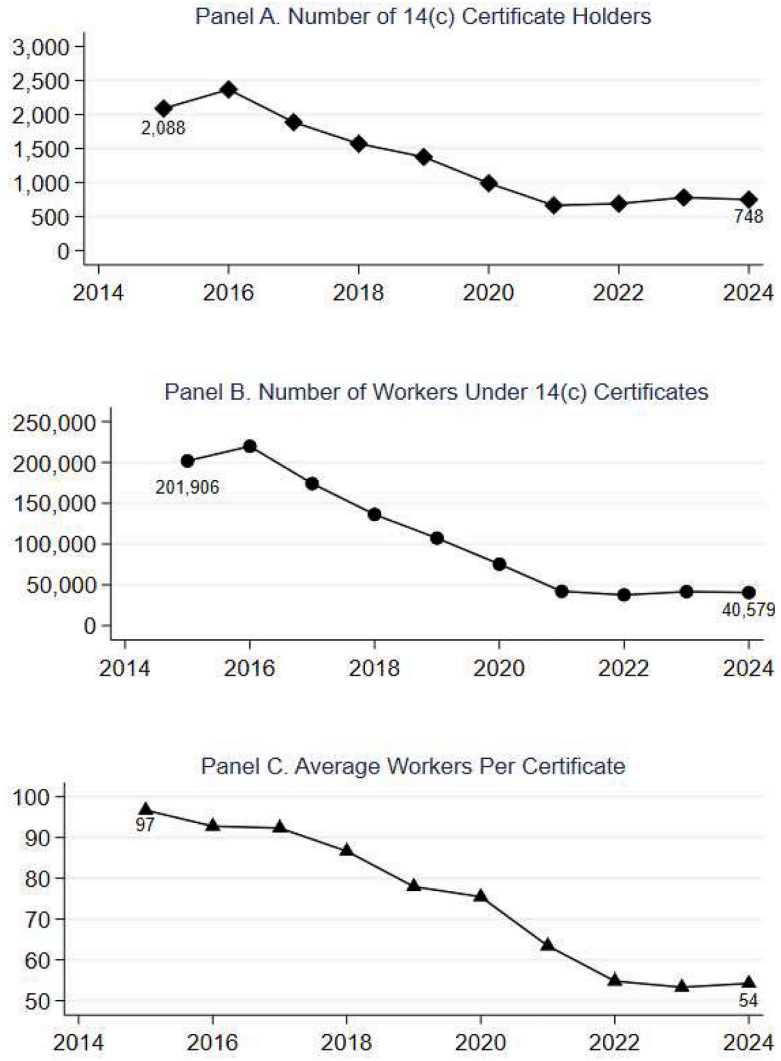


Fig. 1. Number of 14(c) Certificates Holders and Workers. Data source: 14(c) Certificate Holder Data, Department of Labor Wage and Hour Division, 2015–2024.

elimination policies and completed the phase-out by 2024 ("Completed phase out") exhibit a distinct, sharp structural break where usage drops to zero. This distinction is vital for our identification strategy: our difference-in-differences design isolates the causal policy shock, the sharp elimination of certificates, from the broader, gradual erosion of the sheltered workshop model observed in the control group.

The Persistence of Low-Wage Work (CPS Evidence). In sharp contrast to the trends in the 14(c) program, survey data suggests that low-wage employment for PWD persists. Panel A of Fig. 3 reveals that the share of PWD reporting hourly wages below the statutory minimum in the CPS has remained relatively stable over the last decade, showing no mirror image of the administrative collapse. Panel B of Fig. 3 disaggregates these trends by age, showing that young adults (ages 16–24) are the most likely to report earning subminimum wages. This high prevalence among youth highlights this group's exposure to entry-level wage floors.

The divergence between the collapsing administrative counts (Fig. 1) and the stable survey trends (Fig. 3) highlights the importance of our dual-data strategy. The administrative results allow us to test the direct closure of the formal sheltered workshop sector. The CPS results, by contrast, capture the broader prevalence of subminimum wages in the wider labor market. The fact that survey-reported subminimum wages remain stable despite the 14(c) collapse implies that "de facto" subminimum wage employment, including tipped work, piece-rate tasks, gig labor, measurement errors, and non-compliance, is a structural feature of the disability labor market that exists independently of the Section 14(c) program. Thus, despite policies that remove the formal legal mechanism for subminimum wages, the underlying labor market frictions that drive PWD into low-wage work appear to persist.

5. Empirical strategy

5.1. Event-Study design

We begin with an event study specification to examine the dynamic effects of SWE elimination and assess the parallel trends assumption. Using state-year level administrative data on 14(c) employment, we estimate:

$$Y_{st} = \alpha + \sum_{\substack{r=-6 \\ r\neq -1}}^{r=2} \beta_1^r SWE_{elimination_{st}} \times 1\left[r = t - t_s^*\right] + \beta_2 X_{st} + \xi_s + \zeta_t + \xi_s \times \zeta_t + \varepsilon_{st} \tag{3}$$

where Y_{st} represents the outcome for state s in year t. The indicator functions $1\left[r = t - t_s^*\right]$ represent time relative to the year of SWE elimination (t_s^*) for each state. $\text{SWE}_{\text{elimination}_{st}}$ equals one if state s had eliminated SWE by year t, and zero otherwise. Coefficients β_1^r for each

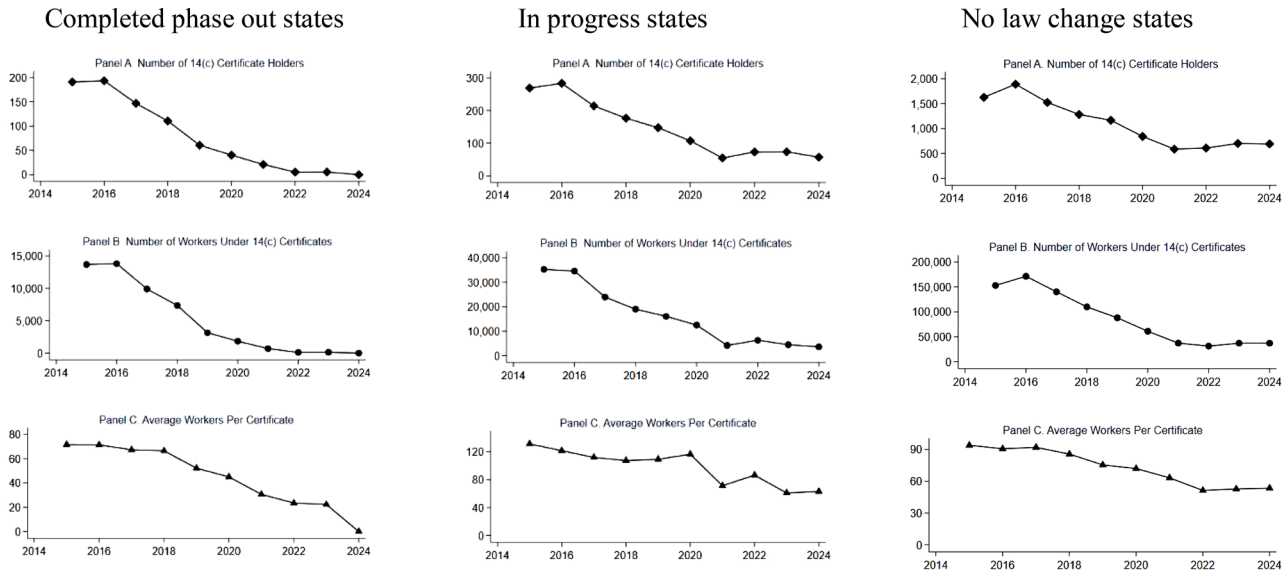


Fig. 2. Number of 14(c) Certificates Holders and Workers by State Policy Status. Notes. This figure presents the number of Section 14(c) employers, the number of 14 (c) employees, and the average number of workers per certificate across three groups of states: those that have completed the elimination of Section 14(c) (completed phase-out states), those currently in the process of eliminating subminimum wage employment (in-progress states), and those that continue to permit subminimum wage employment (no law-change states). Data source: 14(c) Certificate Holder Data, Department of Labor Wage and Hour Division, 2015–2024.

$r \in [-6,\ 2]$ measure changes in outcomes for treatment states relative to control states at each event time, with the year prior to elimination ($t = -1$) as the reference period.

State-level control variables X_{st} include effective minimum wages, state EITC rates as a percentage of the federal credit, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate.[3] We include state fixed effects ξ_s to account for time-invariant unobserved heterogeneity and year fixed effects ζ_t to capture common time trends. Standard errors are clustered at the state level.

We estimate a parallel individual-level event-study model using CPS microdata to assess broader labor market outcomes for PWD:

$$Y_{ist} = \alpha + \sum_{\substack{r=-6 \\ r\neq -1}}^{r=3} \beta_1^r \beta_1^r SWE_{elimination_{st}} \times \ 1\left[r = t - t_s^*\right] + \beta_2 X_{ist} + \beta_3 X_{st} + \xi_s + \zeta_t + \xi_s \times \zeta_t + \varepsilon_{ist} \tag{4}$$

where Y_{ist} denotes individual-level outcomes and X_{ist} includes sex, age, race and ethnicity, marital status, educational attainment dummies (less than high school, high school degree, and some college), and number of children in the household. All other variables are as defined in Eq. (3). We use ORG data to test effects on subminimum wage employment status and hourly wages, and ASEC data for employment, CIE status, hours worked, and income. All models are weighted using corresponding CPS person-level weights.

5.2. Difference-in-Differences specification

To estimate the aggregate effect of SWE elimination, we complement the event-study analysis with a standard DID framework:

$$Y_{ist} = \alpha + \beta_1 SWE_{elimination_{st}} + \beta_2 X_{ist} + \beta_3 X_{st} + \xi_s + \zeta_t + \xi_s \times \zeta_t + \varepsilon_{ist} \tag{5}$$

where $SWE_{elimination_{st}}$ indicates the proportion of year t during which SWE was eliminated in state s, allowing for within-year variation in implementation timing. For example, Alaska's elimination took effect on February 16, 2018, so the variable equals 0.875 in 2018 and 1 for subsequent years. All other variables are as defined in Eq. (4). The coefficient β_1 represents the average effect of SWE elimination across treated states.

Recent methodological advances have shown that varying treatment effects across cohorts with different treatment timings can complicate event study interpretation. In our case, there are six treatment cohorts: one state eliminated SWE in 2015, two states in 2018, two in 2020, two in 2021, two in 2022, and two in 2023. Sun and Abraham (2021) demonstrate that if cohorts exhibit distinct time-dependent treatment effects patterns, traditional event study estimates may be biased due to contamination from effects in other time periods. We therefore apply the Sun and Abraham (2021) estimator to all of our specifications, correcting for biases common in two-way fixed effects models.

5.3. Identifying assumptions and data normalization

Our identification strategy relies on the parallel trends assumption: in the absence of subminimum wage elimination, trends in outcomes for PWD would have evolved similarly in treatment and control states. We assess this assumption by examining pre-treatment coefficients in the event-study specifications. The absence of statistically significant pre-trends supports the validity of the design.

Survey Measures (CPS). For standard labor market rates derived from the CPS, such as employment and hourly wages, the parallel trends assumption appears to hold in standard specifications. As shown in Figs. 4,5,6, pre-treatment coefficients for various outcome measures including formal 14(c) employment, general employment, hours worked, and earnings measures are close to zero and statistically insignificant, exhibiting no evidence of differential trajectories prior to policy implementation.

Administrative Measures and Normalization. The analysis of administrative 14(c) counts presents unique challenges regarding functional form that directly impact the validity of the parallel trends

[3] Our calculations show that states eliminating subminimum wages have generally experienced larger average increases in their general minimum wage compared to states that still allow subminimum wage employment. This raises a potential concern about whether the general minimum wage can be considered a "good control" in our analysis. To address this, we present results without controls for the general minimum wage as a robustness check.

Fig. 3. Share of Workers with Subminimum Wages Using CPS Data. Panel B. Share of Working-age Earners with Disabilities Earning Subminimum Wages by Age Group. Data source: Current Population Survey Outgoing Rotation Group (CPS-ORG) Earnings Data, 2008–2024, excluding 2019.

assumption. A key methodological choice in our analysis of administrative data is the use of raw counts with state and year fixed effects rather than using population-normalized counts. This choice merits explanation.

The presence of 14(c) employment is primarily determined by state-specific institutional factors, including Medicaid waiver program structure, historical investment in sheltered workshop infrastructure, and state agency service models. When we normalize 14(c) counts by state population or by PWD population, differential pre-trends emerge (see Appendix Fig. A-1, A-2, and A-3). These patterns likely reflect the endogenous timing of policy adoption: states may have eliminated 14(c) employment precisely when their institutional infrastructure for sheltered workshops was already declining relative to population growth. Normalization by population conflates the policy effect of interest with these pre-existing institutional trends.

To address this, our preferred specification utilizes raw counts controlled by state and year fixed effects. By absorbing time-invariant differences in institutional scale, we isolate the sharp, mechanical structural break caused by the policy ($t = 0$) from the smooth, long-run trends. As shown in Fig. 4, this specification satisfies the parallel trends assumption: the number of 14(c) workers and employers was comparable between treatment and control states in the six years prior to elimination, with pre-treatment coefficients statistically indistinguishable from zero.

6. Results

We interpret our empirical findings through the lens of our conceptual framework established in Section 3. The utility condition in Eq. (2) showed that the net employment effect of eliminating subminimum wages is ambiguous, reflecting the interaction of a positive substitution effect (the increased incentive to work due to higher wages) with negative forces operating through reduced net income from benefit phase-outs and higher wage-dependent participation costs associated with job scarcity and search frictions.

6.1. *The first stage: mechanical elimination of 14(c) employment*

We first verify whether state legislation successfully dismantled the formal subminimum wage sector. Fig. 4 presents event-study estimates

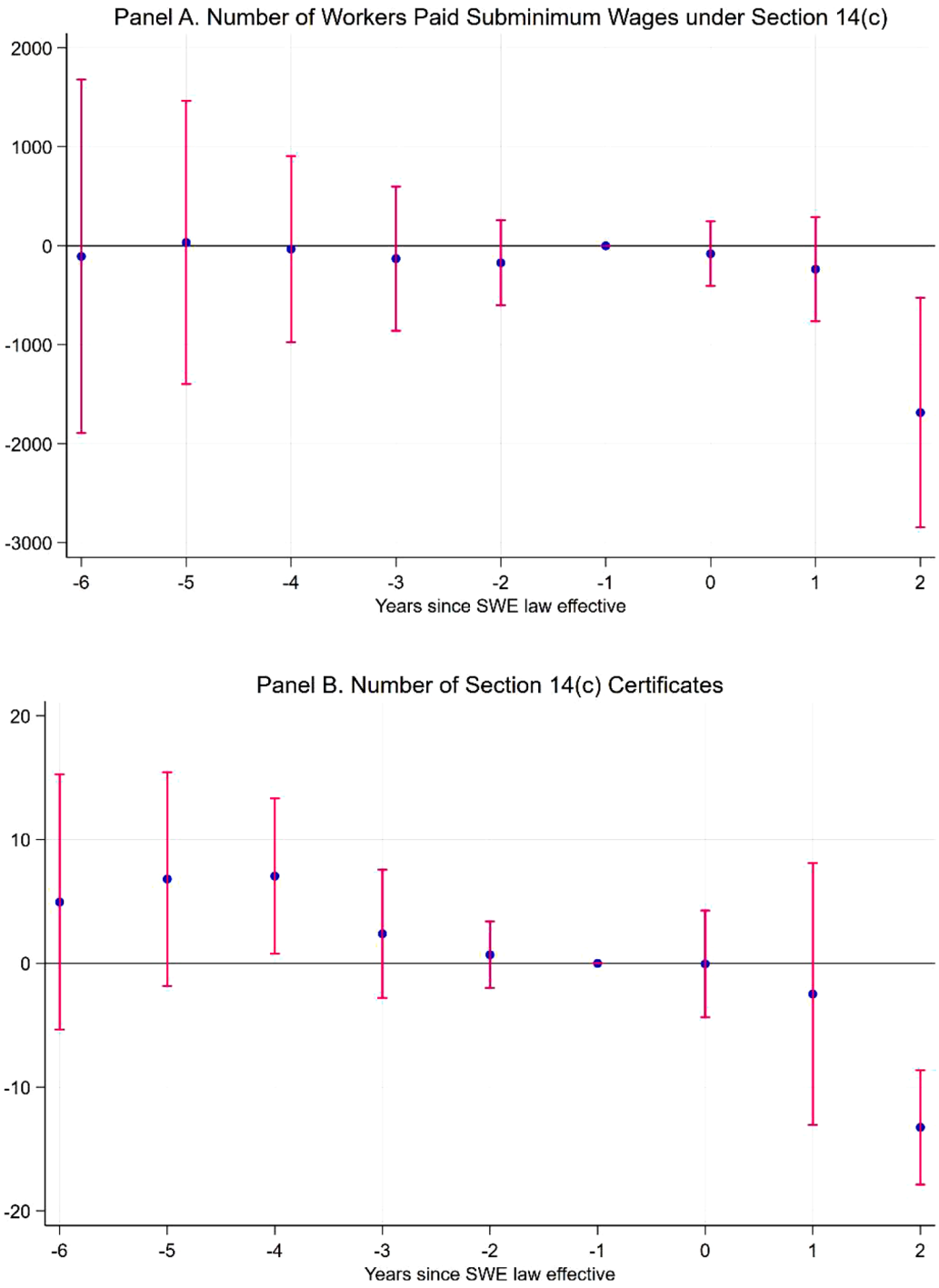


Fig. 4. Effects of SWE elimination on number workers paid subminimum wage and 14(c) employers. Notes. Data are from 14(c) Certificate Holder Data, Department of Labor Wage and Hour Division, 2015–2024. Regressions include controls for state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate.

based on Eq. (3) for the number of workers employed under 14(c) certificates (Panel A) and the number of active certificate holders (Panel B), using administrative data from the DOL. In the six years prior to policy implementation, the estimated coefficients are statistically indistinguishable from zero, confirming that treatment and control states were on parallel trajectories regarding the scale of their sheltered workshop sectors.

Following implementation, we observe a delayed decline in both the number of employers and employees through the 14(c) certificate program. By the second year post-elimination, the stock of workers employed under 14(c) certificates declines by approximately 2000 per state on average ($p < 0.05$), with a corresponding collapse in the number of active employer certificates with an average decline of 14 certificates by two years post-elimination. The lagged decline in both employers and employees is consistent with the institutional structure of 14(c) certification: employers holding valid certificates at enactment could continue using them until expiration (typically two years) but could not renew or apply for new certificates. These results confirm that the policy was effective in its primary mechanical goal: it substantially reduced, and in most cases effectively eliminated, the formal submini-

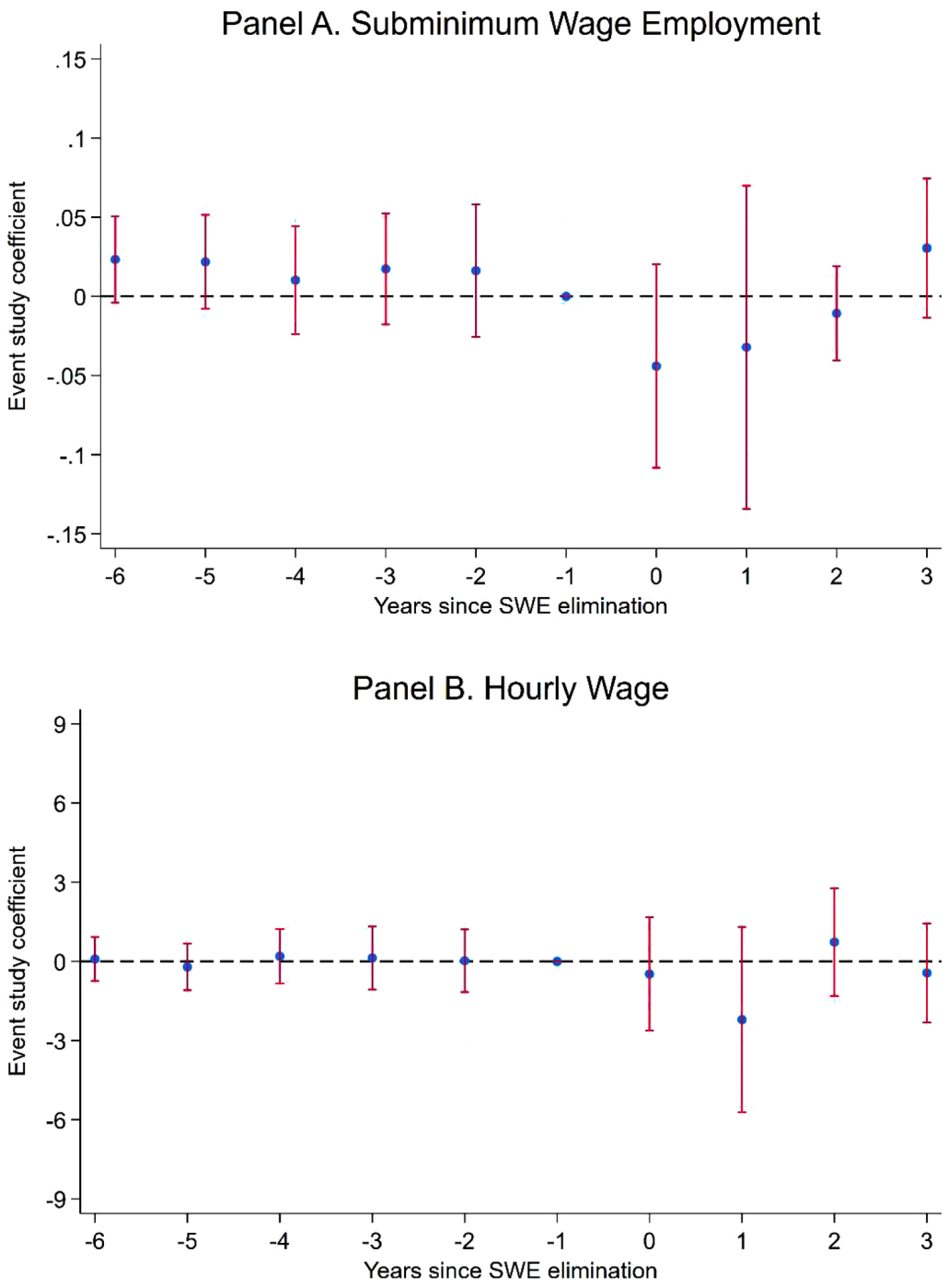


Fig. 5. Effects of SWE elimination on SWE using CPS-ORG data. Notes. Data are from CPS-ORG 2009–2024. All regressions include controls for state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate as well as individual-level control variables: including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by CPS-ORG earnings weights.

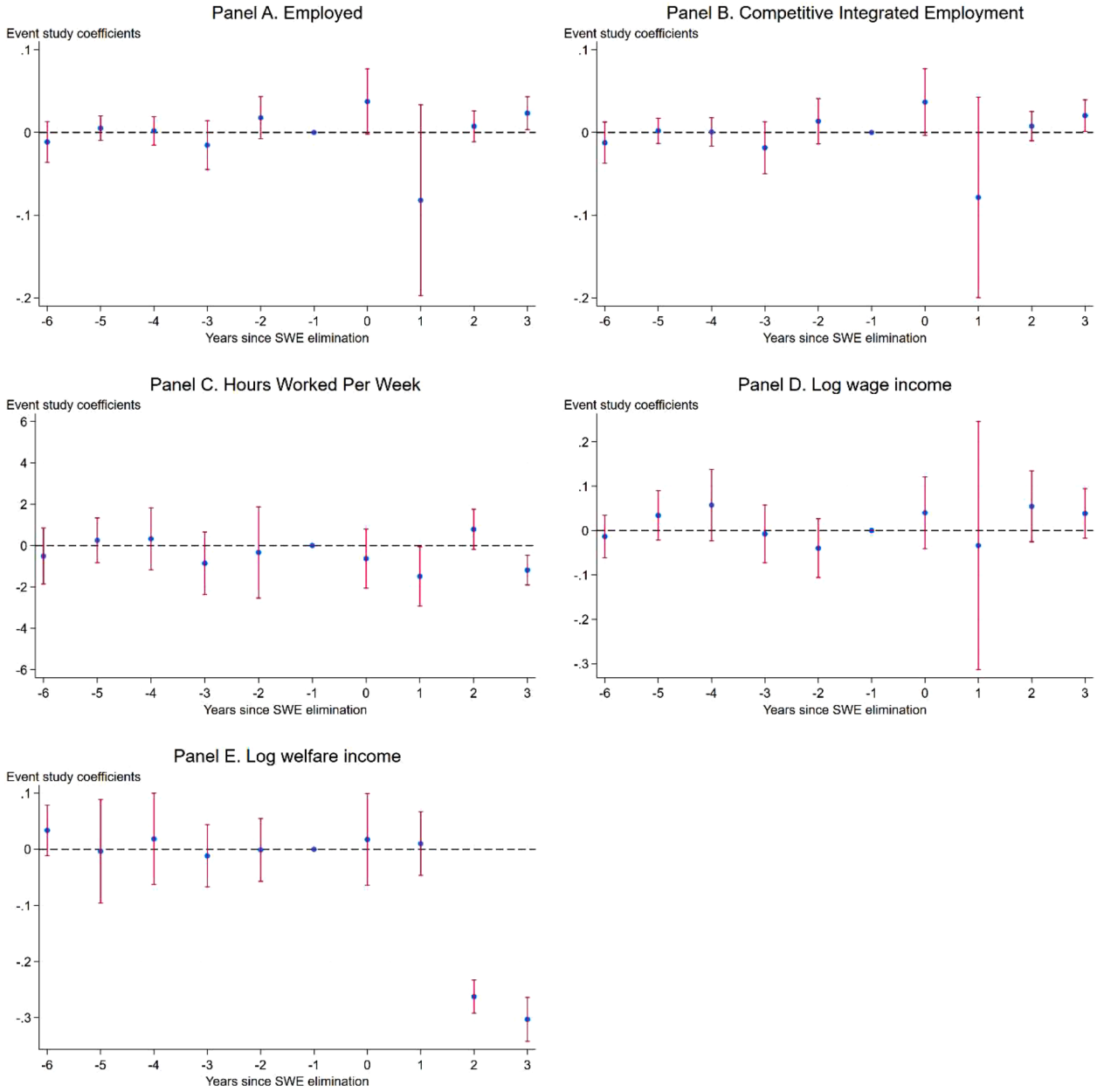


Fig. 6. Effects of SWE elimination on labor market outcomes using CPS-ASEC data. Notes. Data are from CPS-ASEC 2009–2024. Coefficient estimates for panels A, B, C, and D are reported in percentage points. All regressions include controls for state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate as well as individual-level control variables: including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by CPS-ASEC earnings weights.

Table 4
Effects of subminimum wage elimination on labor market outcomes among people with disabilities.

	Subminimum Wage Status (1)	Hourly Wage (2)	Employed (3)	Competitive Integrated Employment (4)	Hours Worked Per Week (5)	Log Annual Wage Income (6)	Log Welfare Income (7)
SWE law effective	−0.019	−0.099	0.060**	0.061**	−0.946	0.198**	−0.124***
	(0.031)	(1.076)	(0.026)	(0.026)	(0.722)	(0.074)	(0.040)
State minimum wage level	0.058***	−0.022	0.004	0.002	0.098	0.007	−0.013
	(0.006)	(0.175)	(0.009)	(0.009)	(0.319)	(0.035)	(0.019)
Observations	47,328	47,328	97,241	97,241	24,460	33,708	97,241
State and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns 1 and 2 used CPS-ORG 2009–2024 data. Columns 3–6 used CPS-ASEC 2009–2024 data. Competitive Integrated Employment is defined as employment where the individual: (i) earns at or above the minimum wage, (ii) is enrolled in a workplace pension plan, (iii) holds a position offering insurance coverage, or (iv) is entitled to paid time off. Standard errors, clustered on state-level, are in parentheses. Controls include state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate and individual-level control variables, including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by ASEC weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

mum wage sector by removing the low-wage segment of the labor market that had previously been accessible through 14(c) certificates.

6.2. Aggregate labor market spillovers

Having established the mechanical impact of the closure of the 14(c) sector, we examine spillovers into the broader labor market for PWD using CPS data.

General Subminimum Wage Employment. Fig. 5 presents event study estimates for the probability of earning below minimum wage (Panel A) and hourly wages (Panel B). In both panels, pre-treatment coefficients are flat and statistically indistinguishable from zero. Post-treatment point estimates for both subminimum wage employment and hourly wages have wide confidence intervals and include zero in all post-treatment years. Columns (1) and (2) of Table 4 report corresponding DID estimates. While the DID estimates are negative, they are imprecisely estimated for both subminimum wage employment and hourly wages.

The reduction in the formal 14(c) employment with no detectable change in broader subminimum wage prevalence suggests that the "de facto" low-wage work (e.g., tipped, informal, or non-compliant work) persists independently of the formal 14(c) program elimination.

Labor Supply: Employment and Hours. ***(1) Extensive Margin.*** Panels A and B of Fig. 6 present event study estimates for overall employment and CIE. Pre-treatment coefficients are close to zero in both cases, supporting parallel trends. The confidence intervals of post-treatment point estimates are wide and overlap zero, indicating imprecision. The DID estimates in columns (3) and (4) of Table 4 show statistically significant increases of six percentage points in both overall employment and CIE following SWE elimination. While static DID estimates suggest a positive aggregate effect, the dynamic event-study coefficients in Fig. 6 are noisy and generally statistically indistinguishable from zero. ***(2) Intensive Margin.*** Next, we present results for weekly hours worked conditional on employment in Panel C of Fig. 6 and column (5) of Table 4. Theory predicts ambiguous effects: income effects and benefit phase-outs could reduce hours, while substitution effects could increase them. For usual weekly hours, estimates are small in magnitude and statistically insignificant. Both the event study and DID results show no detectable effects. This suggests that SWE elimination did not substantively affect work intensity among the employed.

This aggregate null result is consistent with the "offsetting forces" prediction of Eq. (2). For the average person with a disability, the positive substitution effect appears to be largely canceled out by the increased barriers associated with search frictions.

Wages and Income Our model predicts that workers who remain employed should earn higher wages due to the binding wage floor, with corresponding increases in wage income. As noted above, we find no statistically significant effects on hourly wages in CPS-ORG data (column 2, Table 4). Panel D of Fig. 6 and column (6) of Table 4 examine log annual wage income using CPS-ASEC. The DID estimate indicates a statistically significant 19.8 percent increase in log wage income. However, event study coefficients are imprecise with wide confidence intervals that include zero throughout, suggesting caution in interpreting the timing and persistence of this effect.

The absence of a wage spike is consistent with compositional exit. If the lowest-productivity workers who previously earned subminimum wages exit employment due to binding demand constraints, they disappear from the wage distribution. While the average wage of the remaining workforce may be higher, this likely represents a selection effect rather than a causal wage gain for the incumbent workforce.

The table estimates in Table 4 appear easier to reconcile than the event study plots in Fig. 6. In particular, the coefficient on SWE law effective implies a 19.8 percent increase in log annual wage income (column 6) alongside a 12.4 percent decline in log welfare income (column 7). A simple back-of-envelope calculation confirms these magnitudes are mutually consistent.

Consider a representative affected individual earning approximately $8000 per year in wages prior to elimination. A 19.8% increase in annual wage income implies approximately $1580 in additional annual earnings. Under SSI's 50% benefit reduction rates (applied after the $85 general exclusion), this would reduce SSI benefits by roughly $748 per year (Smalligan and Boyens, 2022). Given that an individual earning $8000 annually would receive approximately $5760 in SSI benefits under 2019 rules, a $748 reduction corresponds to a welfare income decline of roughly 13 percent, which aligns closely with our estimated 12.4 percent decline in column 7 of Table 4.

The event study in Fig. 6, by contrast, display substantially wider confidence intervals, particularly in years 0 and +1, driven by the smaller cell sizes when the sample is divided by event-time bin. The null effect on log wage income in Panel D therefore reflects imprecision rather than a true zero; the point estimates in the post-period are consistently positive, but insufficiently powered to achieve statistical significance at conventional levels. The pronounced decline in welfare income visible in Panel E at years +2 and +3 likely reflects the lagged

administrative adjustment of SSI benefits following annual income verification.

6.3. Exploratory heterogeneity by education, age, and disability intensity

Theory predicts that the labor market effects of SWE elimination should vary with worker productivity. In our framework, a higher wage floor reduces job availability through the labor-demand while increasing participation costs through the wage-dependent search cost term. These forces imply that any employment losses should be most pronounced among workers with lower productivity, weaker labor market attachment, or higher disability-related barriers. To explore these possibilities, we examine heterogeneity by educational attainment, age group, and disability intensity (proxied by having one versus multiple reported disabilities). Event-study estimates are presented in Appendix Figs. A-7 through A-9, with pooled DID estimates reported in Appendix Tables A-2 through A-4. We emphasize that these analyses are exploratory. Across several subgroups, particularly individuals with less than a high school education, younger workers, and individuals with multiple disabilities, the event-study pre-trends deviate from parallel trends, limiting causal interpretation.

Despite these identification challenges, a consistent pattern emerges across dimensions. We do not observe robust statistical evidence of large or sustained employment declines following SWE elimination for any subgroup. For subgroups where pre-trends are flatter, including individuals with at least a high school degree and those with a single reported disability, we similarly do not observe consistent declines in either employment or competitive integrated employment.

Taken together, these exploratory results provide important nuance to the aggregate null finding. Even when focusing on subgroups that are often cited as most vulnerable to SWE elimination, including workers with lower education, older age, or higher disability intensity, we find no evidence consistent with widespread labor market displacement. While limited precision and pre-trend violations preclude causal claims about differential effects, the absence of large negative impacts across multiple dimensions is itself informative for policy discussions surrounding the elimination of subminimum wage employment.

6.4. The benefit interaction

We next examine how SWE elimination interacts with the safety net through the benefit phase-outs. In our conceptual framework, higher earnings reduce transfer receipt because means-tested benefits decline as wage income rises. Thus, if SWE elimination raises workers' earnings, we should observe corresponding reductions in reliance on means-tested transfers.

Panel E of Fig. 6 and column (7) of Table 4 present results for log welfare income. The DID estimate shows a statistically significant decline of 12.4 percent, and the event study results for welfare income also show statistically significant declines in years 2 and 3 following elimination, indicating a more robust and sustained reduction in public assistance receipt ($p < 0.01$).

Our finding suggests that the policy successfully triggered the benefit phase-out mechanism for a subset of workers. The suggestive increases in wage income combined with more clearly documented decreases in welfare receipt is consistent with SWE elimination promoting transitions toward greater economic self-sufficiency rather than increased dependence on public assistance.

6.5. Employment composition effects

To explore whether SWE elimination induced occupational reallocation, we examine employment across 12 occupation groups. As shown in Appendix Table A-1, results show no statistically significant changes in the distribution of PWD across occupations following elimination. This suggests that the policy did not induce widespread reallocation across sectors, possibly reflecting limited opportunities for occupational transitions or persistence in existing job placements.

7. Robustness and sensitivity analyses

We conduct a series of robustness checks to ensure the internal validity of our main findings. These checks address concerns regarding model specification and potential confounders.

7.1. Model specification and controls

A longstanding debate in the minimum wage literature concerns the inclusion of state-specific linear time trends. While these trends may capture unobserved, smoothly evolving state labor market conditions, they may also absorb the dynamic effects of the policy itself, potentially attenuating estimated impacts. Accordingly, we treat state-specific trends as a sensitivity check rather than part of our baseline specification. In Eqs. (3) and 4, we estimate specifications that include state-specific time trends, $\xi_s \times \zeta_t$, consistent with prior minimum wage research (Allegretto et al., 2017). We interpret these specifications cautiously, as emphasized by Meer and West (2016).

To address sensitivity, we re-estimate our baseline event studies for both administrative and survey outcomes excluding state-specific time trends. As shown in Appendix Fig. A-5 and A-6, our findings for subminimum wage employment, hourly wages, employment, hours worked, wage income, and welfare income in the CPS are robust to the exclusion of these trends; coefficients remain statistically indistinguishable from zero.

Furthermore, we address the concern that SWE elimination is often legislatively bundled with general statutory minimum wage increases. If our results were driven by a rising general wage floor rather than the specific elimination of the 14(c) provision, including the state minimum wage as a control variable might be inappropriate. We therefore re-estimate our models excluding controls for the state statutory minimum wage. The results, displayed in Fig. A-4, are quantitatively identical to the baseline. This stability confirms that our findings capture the specific impact of eliminating the subminimum wage option, independent of broader minimum wage policy.

7.2. Anticipation effects

Our identification relies on the assumption that employers do not preemptively dismantle 14(c) arrangements prior to the policy's effective date. We test this by re-estimating our baseline models using the legislative enactment date rather than the effective date as the treatment shock. We find no statistically significant divergence in outcomes between enactment and implementation. This result, combined with the flat pre-trends observed in our main event studies, supports the validity of our standard treatment timing and suggests that anticipation effects do not bias our estimates downward.

8. Conclusion and policy implications

This study provides the first national-level empirical analysis of the labor market effects of eliminating SWE for people with disabilities. Leveraging novel administrative data on the universe of Section 14(c) certificate holders, and exploiting the staggered adoption of SWE reforms across fifteen states, we document that state elimination policies successfully dismantled the formal Section 14 (c) employment, accelerating a secular decline already underway. Within two years of

implementation, states experienced average declines of approximately 2000 workers and 14 certificate holders. These effects are precisely estimated, with clear post-treatment divergence and no differential pre-trends.

However, our analysis of broader labor market outcomes reveals a nuanced picture that challenges simple narratives of "job loss" or "wage gains." In the aggregate, we find no precise measurable change in employment rates or hourly wages for PWD. Instead, we find suggestive evidence that SWE elimination promotes economic self-sufficiency: point estimates indicate increased wage income and statistically significant reductions in welfare receipt. These patterns are inconsistent with the concern that SWE elimination would increase dependence on public assistance.

We interpret these results through our conceptual framework in which higher wage floors create both incentives and barriers. The absence of detectable aggregate employment effects likely reflects a "compositional churn" where two opposing forces offset one another: the substitution effect, which incentivizes higher-productivity individuals to enter the labor force due to higher wages, and the increased difficulty of securing employment for the most vulnerable workers as hiring standards adjust. This aggregate null effect is further reinforced by the relatively small size of the 14(c) population, which dilutes localized displacement effects in national data, and by the prevalence of lateral transitions to statutory minimum wage roles that do not generate large observable wage gains. Thus, the policy achieves its first-stage objective by eliminating formal subminimum wage employment without imposing substantial employment costs.

However, this aggregate characterization masks an important distributional tension. While workers who retain or gain competitive integrated employment following elimination plausibly experience meaningful gains in earnings and job quality, the workers most likely to exit, for instance, those with the weakest pre-policy labor market attachment and the lowest productivity relative to the new wage floor, may lose access to structured employment entirely. For this subset, the policy's benefits are less clear, and the aggregate null employment effect should not be interpreted as evidence that all workers are equally unaffected. Policymakers should therefore be attentive to the possibility that subminimum wage elimination without complementary investments in supported employment, job coaching, and transitional services may leave the most vulnerable workers without adequate alternatives, even as the policy improves outcomes for the broader population of workers with disabilities.

Our study has several limitations that merit acknowledgement and point toward future research. First, our identification relies on the variation provided by the fifteen states that have adopted SWE reforms to date. While sufficient for estimating aggregate effects, this sample size constrains the precision of our estimates for smaller subpopulations, particularly when testing for heterogeneity by disability type. As more states implement bans, future work will be better positioned to estimate these gradients with greater precision.

Second, our administrative data allows us to observe the decline of the 14(c) sector, but we cannot link these records to individual-level survey data. Consequently, we cannot trace the specific trajectories of displaced 14(c) workers, i.e. whether they transitioned to CIE, moved into alternative non-work day programs, or exited the labor force entirely. Developing linked employer-employee datasets that cover this specific population remains a critical priority for understanding the welfare consequences of displacement.

Third, our results focus on the short-to-medium term dynamics following policy implementation. The longer-term effects on career advancement, human capital accumulation, and earnings growth remain open questions. It is possible that the initial search frictions we identify dissipate over time as employers adjust production technologies or as workers acquire new skills, potentially leading to more positive long-run equilibrium outcomes than our short-run estimates suggest.

Despite these limitations, our findings carry significant implications for the ongoing federal debate regarding the phase-out of Section 14(c). The persistence of low-wage work in the survey data, even after SWE elimination, suggests that legislative bans alone are insufficient to guarantee CIE. Without addressing the underlying labor demand constraints, workers may transition into informal, gig-based, or non-compliant arrangements that offer little economic advancement.

Furthermore, the potential displacement of low-productivity workers highlights the need for complementary supply-side investments. To offset the increased fixed costs of finding and maintaining competitive employment, elimination policies should be paired with robust funding for vocational rehabilitation, job coaching, and accessible transportation. Finally, policymakers should consider demand-side incentives to bridge the gap between the statutory minimum wage and the marginal revenue product of workers with the most significant support needs. Targeted wage subsidies, similar to those employed successfully in Sweden (Angelov and Eliason, 2018), could reduce the effective cost of hiring for employers without reducing the take-home pay of workers. Such measures would directly address the search friction identified in our model, ensuring that the elimination of subminimum wages leads to genuine labor market inclusion rather than market exit (Friedman and Rizzolo, 2020).

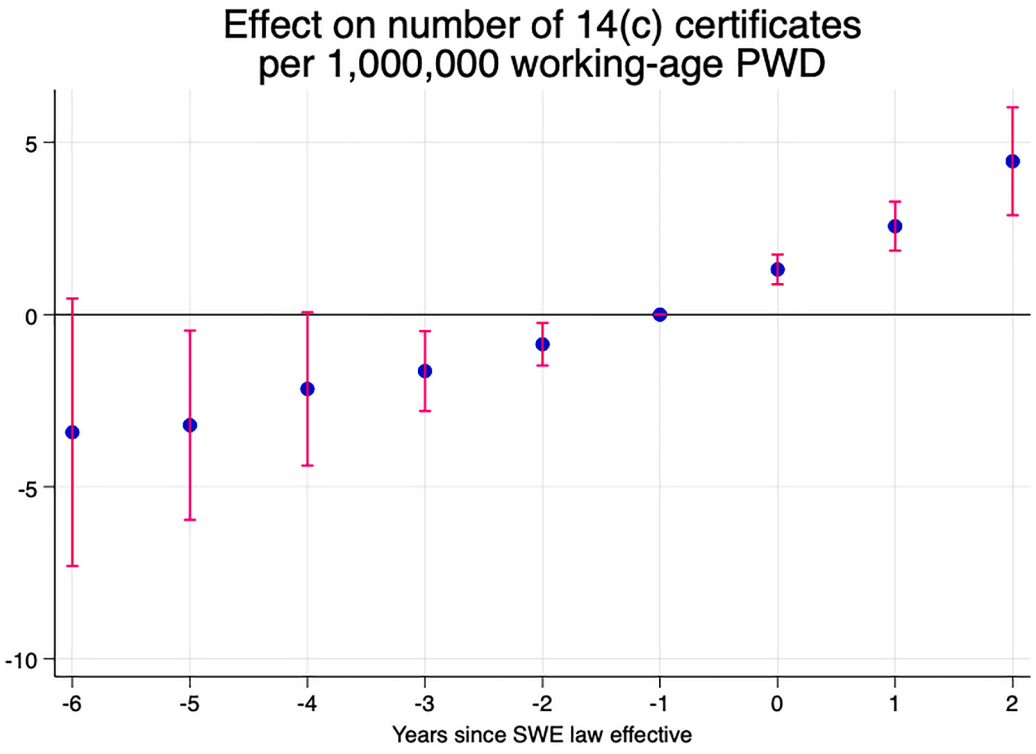
In conclusion, this study demonstrates that targeted wage reforms can meaningfully reduce subminimum wage employment under 14(c) certificates without reducing labor market efficiency or employment opportunities for PWD. These findings are particularly relevant as policymakers consider phasing out Section 14(c), offering evidence to inform the ongoing debate. Continued policy evaluation, along with investments in workforce development, will be essential to maximizing the long-term benefits of these reforms.

CRediT authorship contribution statement

Michelle Yin: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Regina Seo:** Writing – original draft, Methodology, Formal analysis. **Hoa Vu:** Writing – review & editing, Methodology, Formal analysis.

Appendix

Fig. A-1, Fig. A-2, Fig. A-3, Fig. A-4, Fig. A-5, Fig. A-6, Fig. A-7, Fig. A-8, Fig. A-9, Table A-1, Table A-2



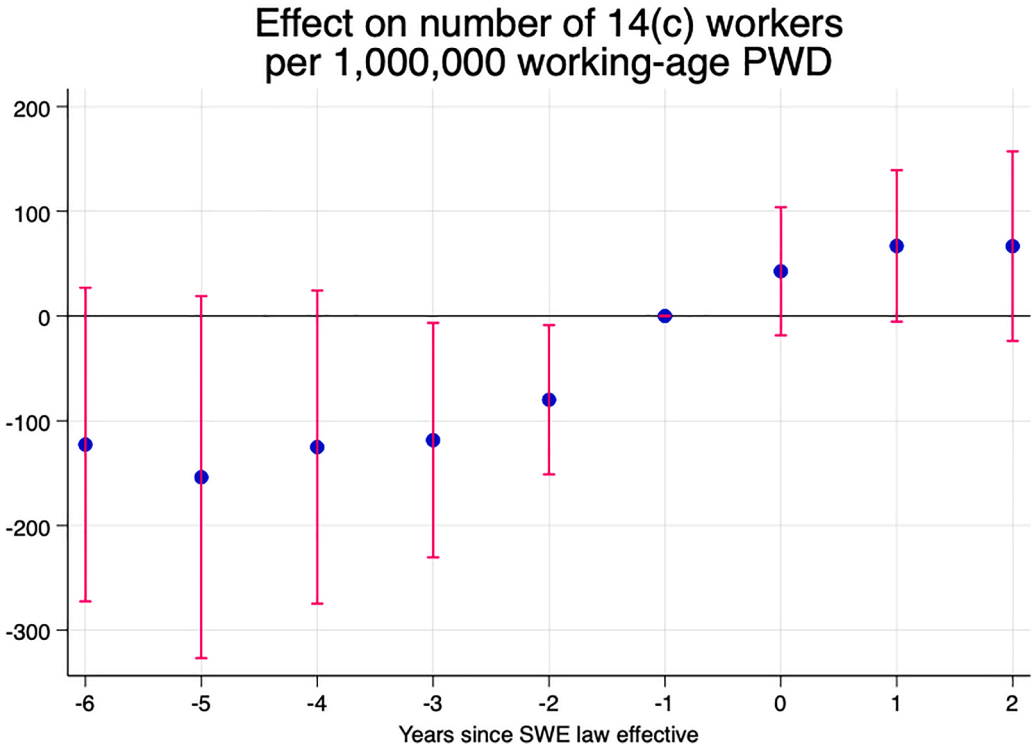
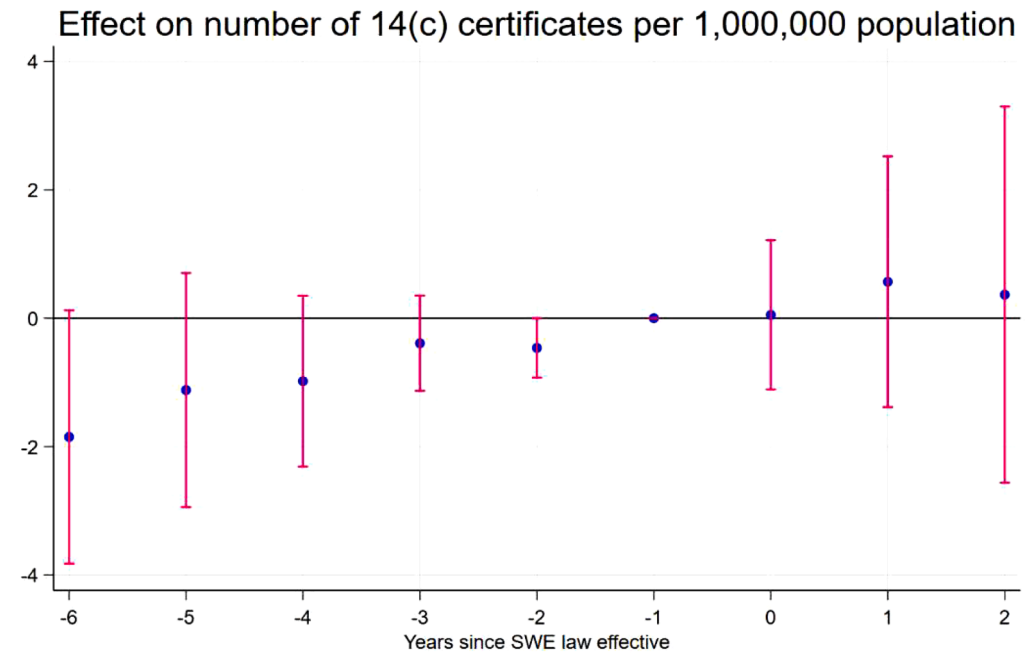


Fig. A-1. Effects of SWE elimination on 14(c) workers and employers – normalized by PWD population.



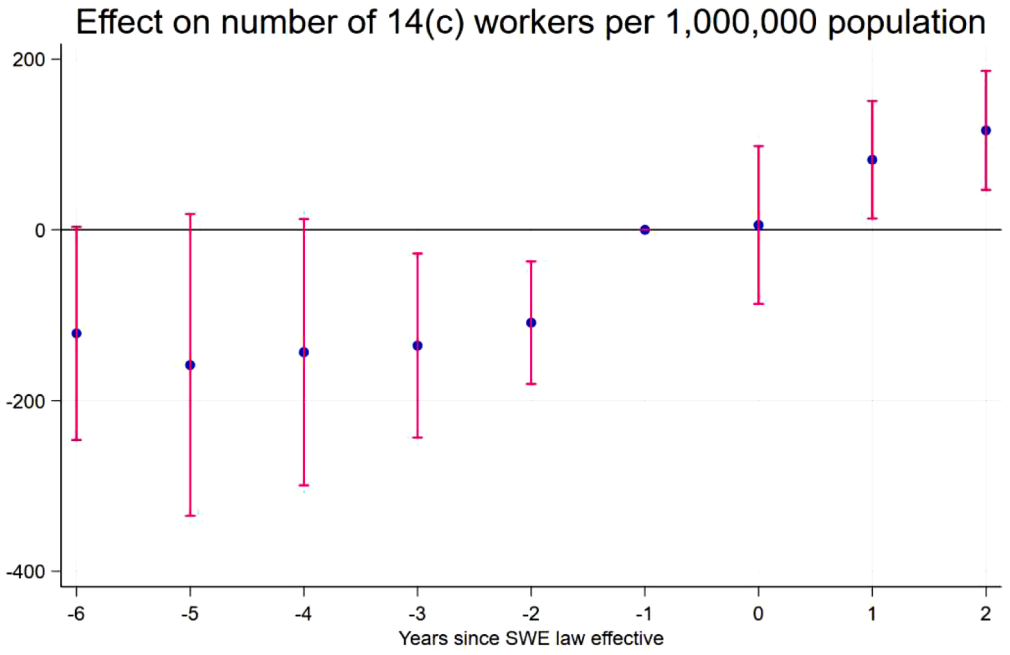
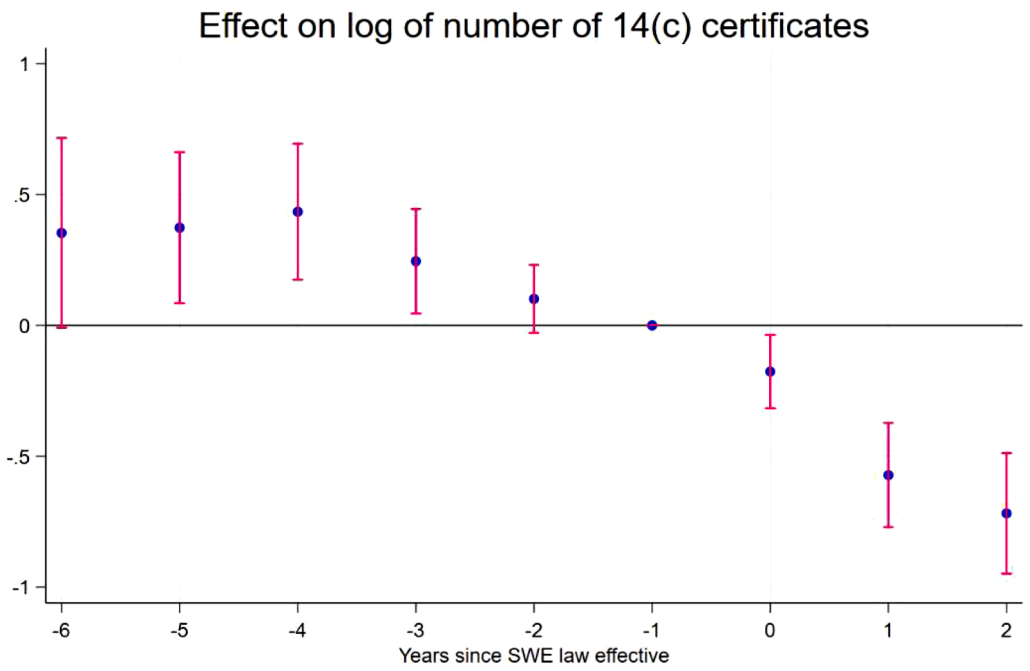


Fig. A-2. Effects of SWE elimination on 14(c) workers and employers – normalized by population.



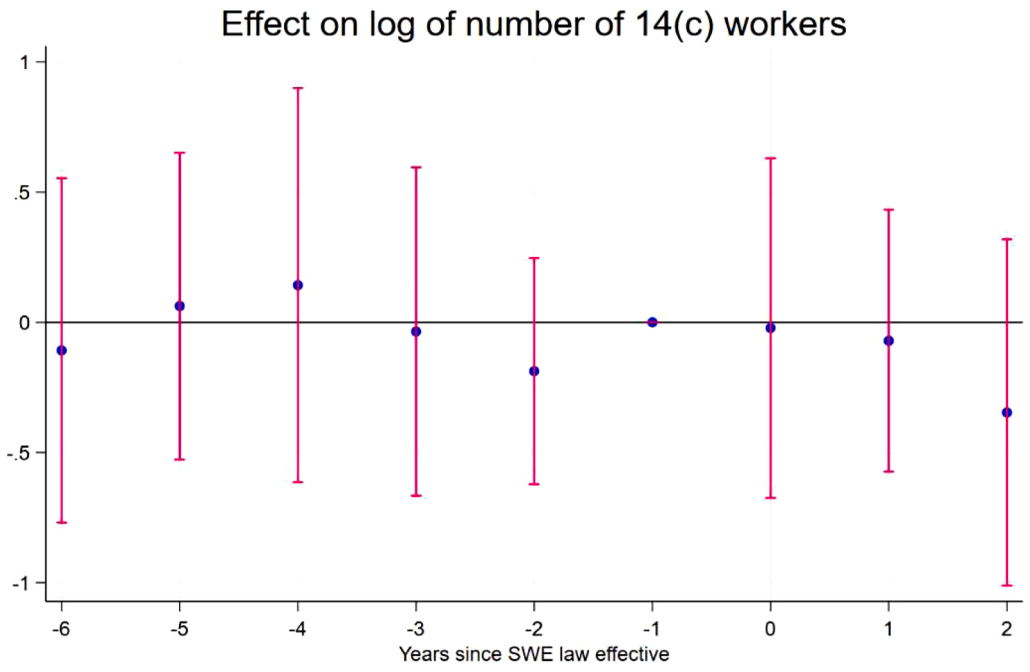


Fig. A-3. Effects of SWE elimination on 14(c) workers and employers – take log.

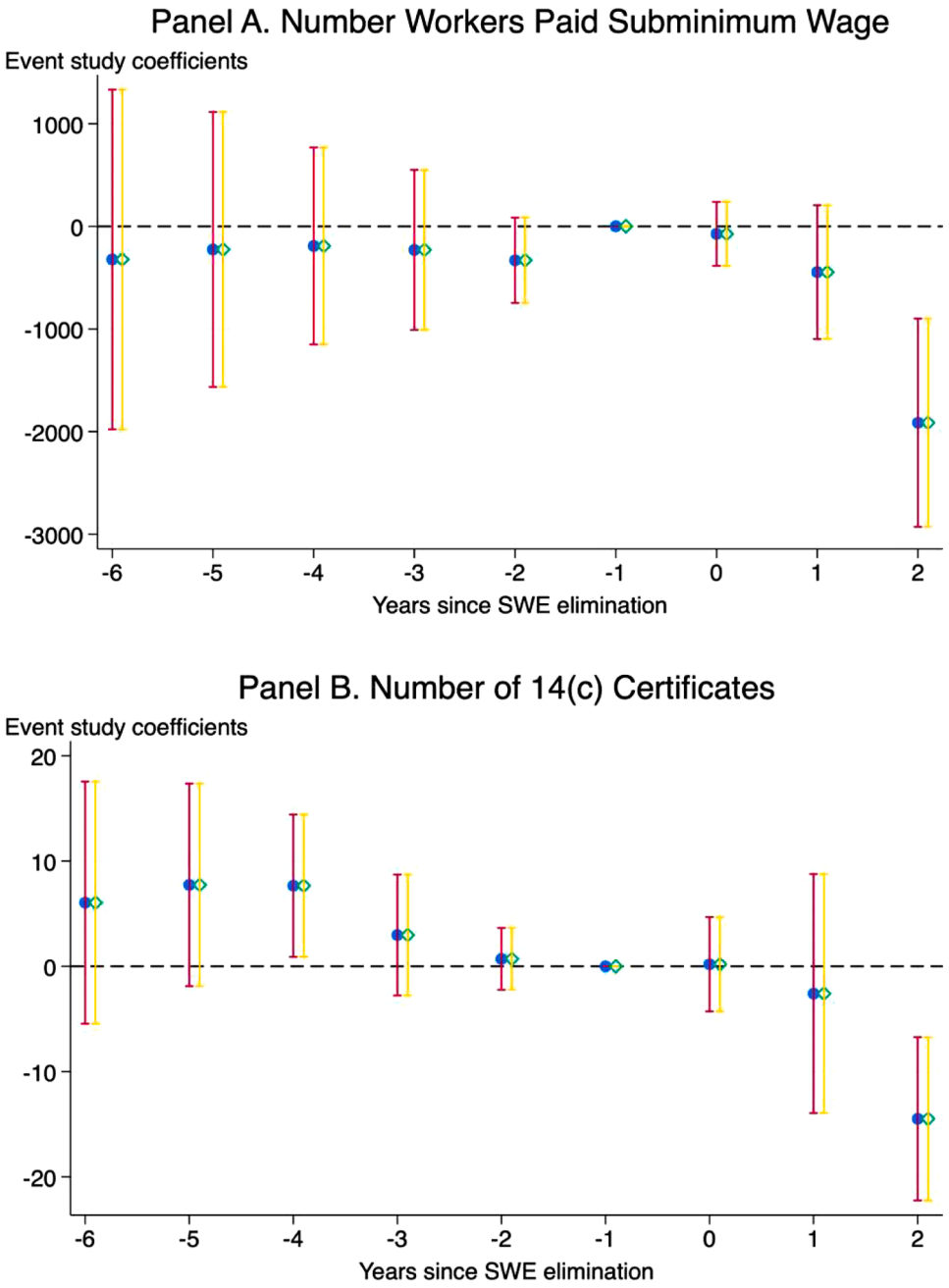


Fig. A-4. Robustness check: Effects of subminimum wage elimination on number workers paid subminimum wage and 14(c) employers. Data are from 14(c) Certificate Holder Data, Department of Labor Wage and Hour Division, 2015–2024. The blue circle represents the baseline estimate *with controls for state minimum wage levels*. The diamond indicates estimates *excluding controls for state minimum wage levels*. All regressions include controls for state-level EITC rate, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate.

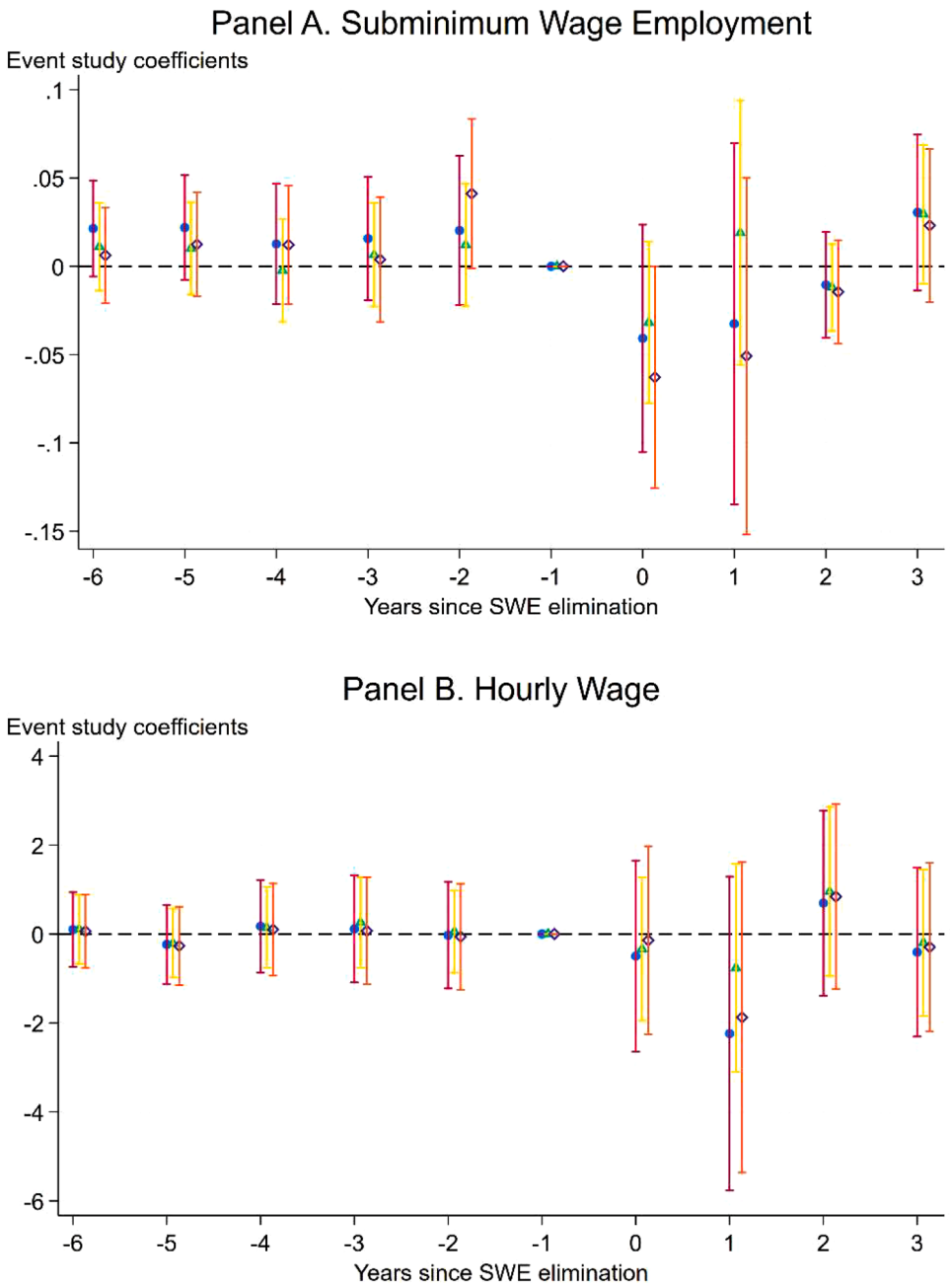


Fig. A-5. Robustness check: Effects of subminimum wage elimination on subminimum wage status and hourly wage. Data are from CPS-ORG 2009–2024. The circle represents the baseline estimate ***with state-specific time trends***. The hollow triangle shows estimates ***excluding state-specific time trends***. The diamond indicates estimates ***excluding controls for state minimum wage levels***. All regressions include controls for state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate as well as individual-level control variables: including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by CPS-ORG earnings weights.

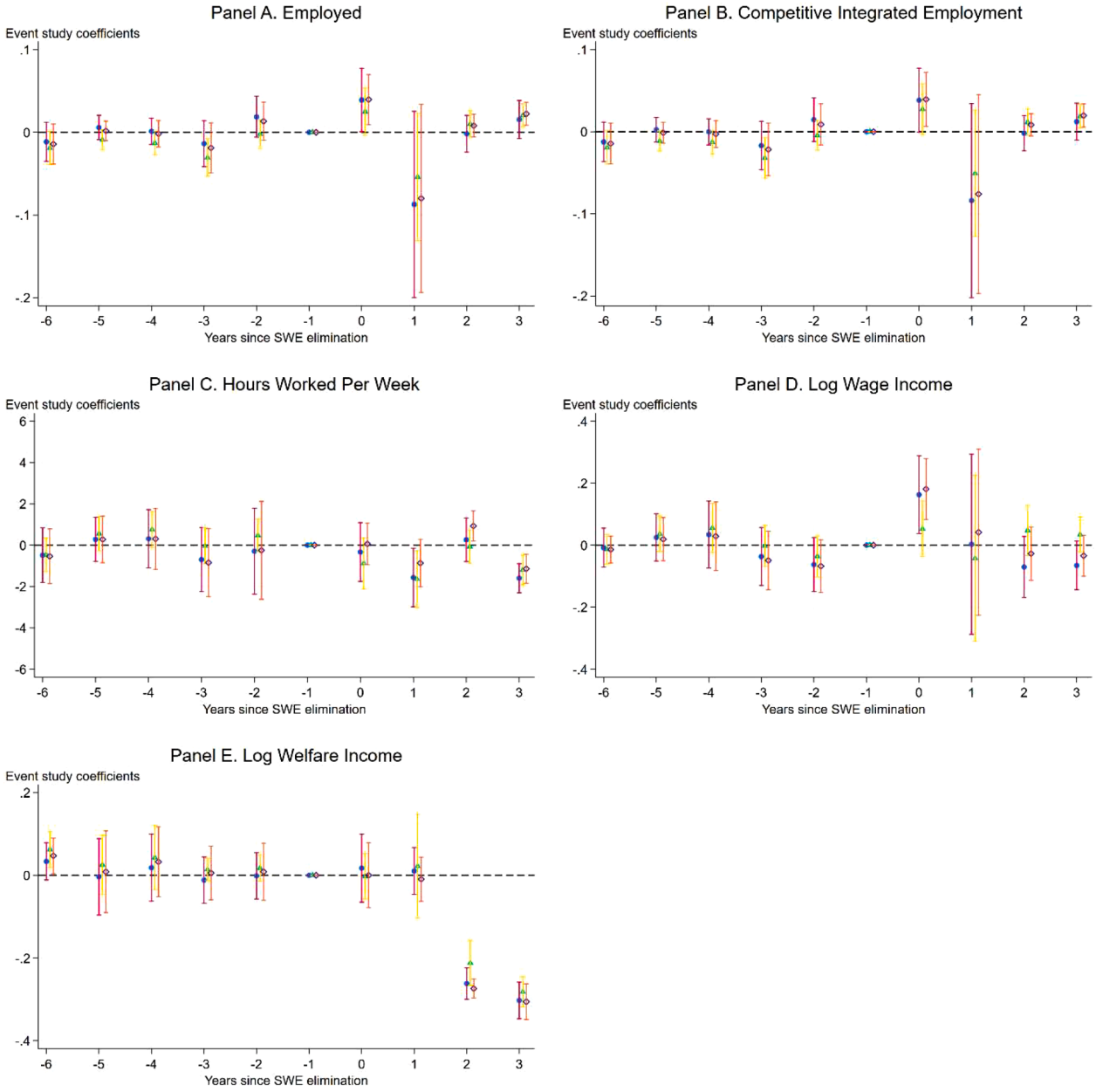


Fig. A-6. 1: Robustness check: Effects of subminimum wage elimination on labor market outcomes. Notes. Data are from CPS-ASEC 2009–2024. Coefficient estimates for panels A, B, C, and D are reported in percentage points. The black circle represents the baseline estimate ***with state-specific time trends***. The hollow triangle shows estimates ***excluding state-specific time trends***. The diamond indicates estimates ***excluding controls for state minimum wage levels***. All regressions include controls for state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate as well as individual-level control variables: including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by CPS-ASEC earnings weights.

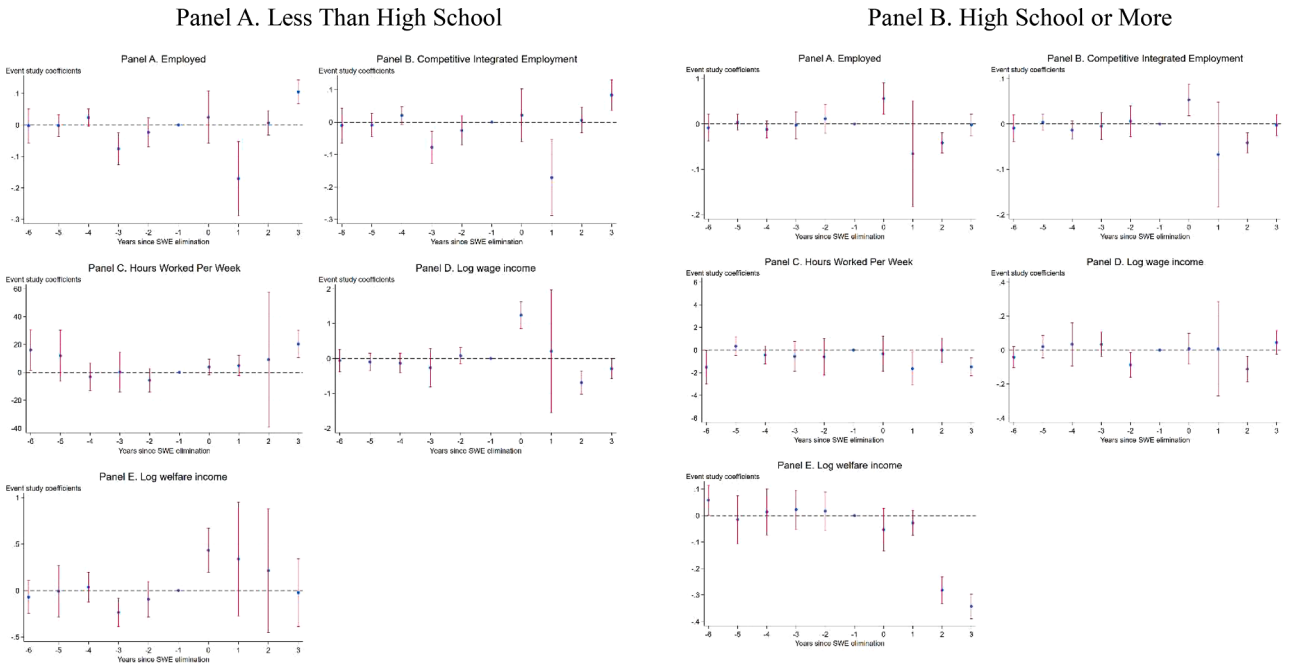


Fig. A-7. Event Study Results by Education, Age 25+.

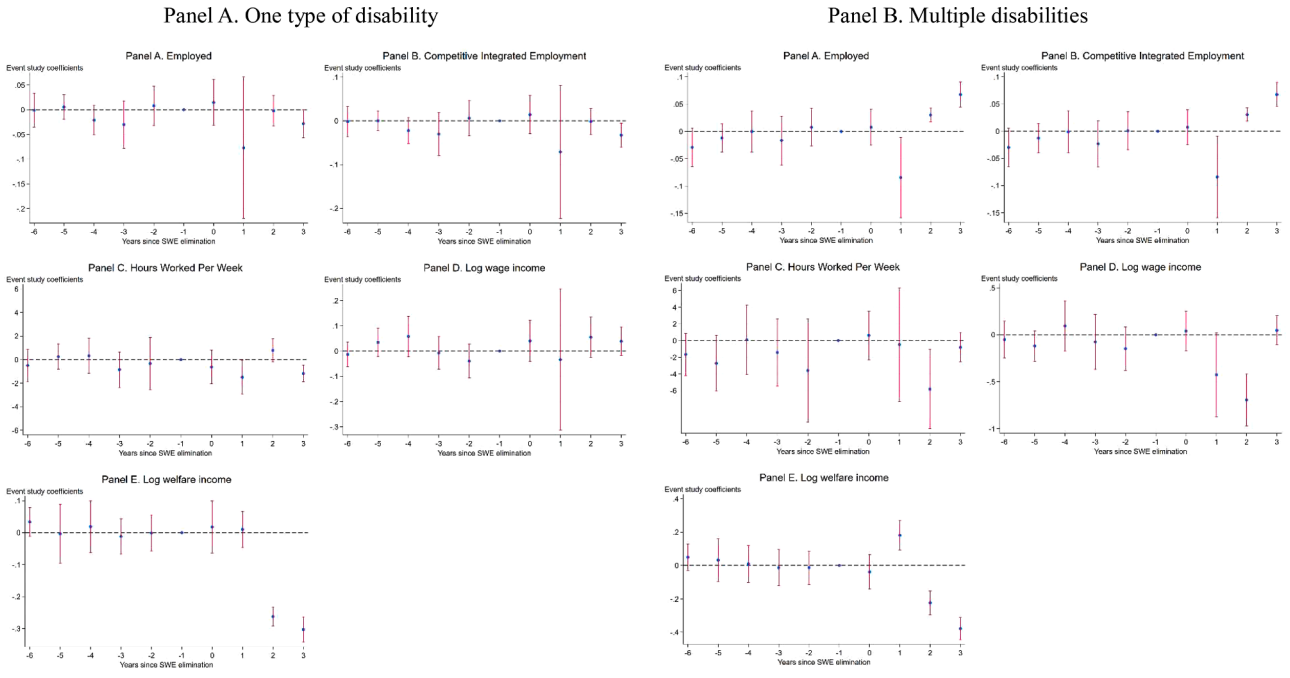


Fig. A-8. Event Study Results by Disability.

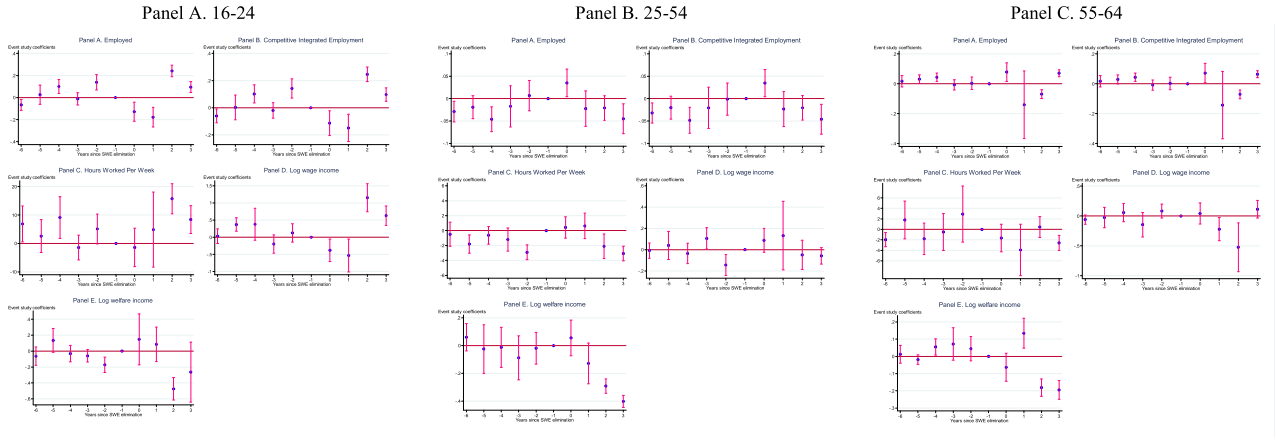


Fig. A-9. Event Study Results By Age Group.

Table A-1
Subminimum wage elimination and occupation sorting among people with disabilities.

	(1) Managerial	(2) Professional	(3) Technicians	(4) Mechanics	(5) Construction	(6) Extractive	(7) Machine	(8) Administrative	(9) Transportation	(10) Sales	(11) Farming	(12) Service
SWE law effective	−0.00745	0.00823	0.00323	0.00037	−0.00114	0.00021	0.00928*	0.00079	−0.01095*	−0.00757	−0.00050	−0.00485
	(0.00616)	(0.00719)	(0.00333)	(0.00379)	(0.00353)	(0.00330)	(0.00479)	(0.00756)	(0.00629)	(0.00618)	(0.00245)	(0.00933)
N	97,241	97,241	97,241	97,241	97,241	97,241	97,241	97,241	97,241	97,241	97,241	97,241
R2	0.03	0.09	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.00	0.02

Notes. Data are from CPS-ASEC 2009–2024 data. Standard errors, clustered on state-level, are in parentheses. Controls include state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate and individual-level control variables, including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by ASEC weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A-2
Effects of subminimum wage elimination on labor market outcomes among people with disabilities, by education level, Age 25+.

	Subminimum Wage Status (1)	Hourly Wage (2)	Employed (3)	Competitive Integrated Employment (4)	Hours Worked Per Week (5)	Log Wage Income (6)	Log Welfare Income (7)
Panel A. High School or Less							
SWE law effective	0.103	−2.232	0.039	0.037	3.372	0.607	−0.021
	(0.201)	(1.895)	(0.100)	(0.098)	(8.272)	(0.728)	(0.531)
Observations	4425	4425	17,179	17,179	2113	3279	17,179
Panel B. More than High School							
SWE law effective	−0.035	0.136	0.027	0.028	−0.137	0.057	−0.057
	(0.025)	(0.685)	(0.056)	(0.054)	(0.904)	(0.073)	(0.055)
Observations	37,253	37,253	72,613	72,613	20,267	27,338	72,613
State and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Columns 1 and 2 used CPS-ORG 2009–2024 data. Columns 3–6 used CPS-ASEC 2009–2024 data. Competitive Integrated Employment is defined as employment where the individual: (i) earns at or above the minimum wage, (ii) is enrolled in a workplace pension plan, (iii) holds a position offering insurance coverage, or (iv) is entitled to paid time off. Standard errors, clustered on state-level, are in parentheses. Controls include state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate and individual-level control variables, including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by ASEC weights. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table A-3
Effects of Subminimum Wage Elimination on Labor Market Outcomes Among People with Disabilities, by Disability Type.

	Subminimum Wage Status (1)	Hourly Wage (2)	Employed (3)	Competitive Integrated Employment (4)	Hours Worked Per Week (5)	Log Wage Income (6)	Log Welfare Income (7)
Panel A. One Type of Disability							

(*continued on next page*)

Table A-3 (*continued*)

	Subminimum Wage Status (1)	Hourly Wage (2)	Employed (3)	Competitive Integrated Employment (4)	Hours Worked Per Week (5)	Log Wage Income (6)	Log Welfare Income (7)
SWE law effective	0.023	-0.662	-0.014	-0.011	-0.291	0.045	-0.156
	(0.023)	(0.648)	(0.068)	(0.064)	(1.169)	(0.085)	(0.105)
Observations	36,837	36,837	57,112	57,112	19,666	25,402	55,190
Panel B. Multiple disabilities							
SWE law effective	-0.207**	0.630	0.037	0.039	-4.588	-0.097	0.089
	(0.097)	(1.898)	(0.030)	(0.031)	(5.361)	(0.195)	(0.064)
Observations	10,491	10,491	42,878	42,878	5,063	8,364	42,878
State and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Columns 1 and 2 used CPS-ORG 2009-2024 data. Columns 3-6 used CPS-ASEC 2009-2024 data. Competitive Integrated Employment is defined as employment where the individual: (i) earns at or above the minimum wage, (ii) is enrolled in a workplace pension plan, (iii) holds a position offering insurance coverage, or (iv) is entitled to paid time off. Standard errors, clustered on state-level, are in parentheses. Controls include state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate and individual-level control variables, including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by ASEC weights. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A-4
Effects of Subminimum Wage Elimination on Labor Market Outcomes Among People with Disabilities, by Age Group.

	Subminimum Wage Status (1)	Hourly Wage (2)	Employed (3)	Competitive Integrated Employment (4)	Hours Worked Per Week (5)	Log Wage Income (6)	Log Welfare Income (7)
Panel A. 16-24							
SWE law effective	-0.017	-1.208	-0.123	-0.107	-12.770	-0.407**	0.106
	(0.085)	(0.872)	(0.084)	(0.083)	(9.320)	(0.193)	(0.177)
Observations	5,650	5,650	10,198	10,198	2,349	3,513	10,198
Panel B. 25-54							
SWE law effective	-0.020	-0.799	0.079**	0.084**	0.661	0.093	-0.142
	(0.035)	(0.642)	(0.036)	(0.037)	(1.167)	(0.138)	(0.136)
Observations	27,196	27,196	52,315	52,315	15,021	20,377	52,315
Panel C. 55-64							
SWE law effective	-0.058**	1.554	-0.033	-0.038	-0.031	0.047	0.013
	(0.026)	(2.698)	(0.129)	(0.128)	(1.908)	(0.147)	(0.078)
Observations	14,482	14,482	37,477	37,477	7359	10,240	37,477
State and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes. Columns 1 and 2 used CPS-ORG 2009-2024 data. Columns 3-6 used CPS-ASEC 2009-2024 data. Competitive Integrated Employment is defined as employment where the individual: (i) earns at or above the minimum wage, (ii) is enrolled in a workplace pension plan, (iii) holds a position offering insurance coverage, or (iv) is entitled to paid time off. Standard errors, clustered on state-level, are in parentheses. Controls include state-level EITC rate, state minimum wage level, state unemployment rates, per capita GDP, the share of SSI recipients with disabilities, and the poverty rate and individual-level control variables, including sex, age, race and ethnicity, marital status, dummies for educational attainment (less than high school degree, high school degree, bachelor's degree, and some college), and number of children in the household. All specifications are weighted by ASEC weights. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Data availability

Data will be made available on request.

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