Adult-Use Cannabis Legalization and Commercial Driving

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EXECUTIVE SUMMARY

Adult-use cannabis (AUC) legalization increases access to and use of cannabis among adults. The start of AUC legal sales coincides with increased demand for labor, as shown by prior studies for agriculture, manufacturing, and service sectors. Distribution of cannabis down the supply chain is expected to increase demand for commercial drivers transporting wholesale cannabis from producers to retailers or providing home delivery services between retailers and consumers. Meanwhile, the United States (US) Department of Transportation (DOT) prohibits consumption of cannabis by commercial drivers and requires that drivers complete pre-employment, random, and post-accident drug testing. Cannabis can be detected in the required urine tests as long as months after the last consumption and associated impairment. As such, some drivers will test positive for cannabis and lose their licenses, and other drivers and potential drivers may choose another occupation because of the medical and/or recreational benefits of consuming cannabis. Therefore, AUC legalization and dispensary access are expected to have ambiguous effects on total employment due to increased demand from the newly legal industry and reduced supply. Increased demand and reduced supply both put upward pressure on wages, so that post-AUC start-of-sales wages are expected to be higher.

Using Current Population Survey (CPS) microdata and O*NET occupation survey data from 2000 to 2024, we estimate how AUC access affects commercial driver employment and hourly wages using a two-stage difference-in-differences design across sectors, including drivers/sales workers and truck drivers, bus drivers, and taxi drivers/chauffeurs. With the exception of a temporary decline in the employment level of bus drivers, we find no evidence of reductions in the employment level of drivers in either data set. Instead, in the CPS, we find slight increases in working hours among truck drivers (22 minutes per week) and in full-time work among self-employed taxi drivers and chauffeurs (0.16 percentage points). Drivers are much more likely to be self-employed (by 1.6 percentage points), especially in trucking (1.3 percentage point increase), suggesting that trucking companies are digging deeper into the available pool of drivers beyond existing fleets. For wages, only self-employed taxi driver wages respond to AUC access – average wages increase by a marginally significant $2.66 with a 22-percentage point reduction in the likelihood of working below the 25th wage percentile and a 24-percentage point increase in the likelihood of working for more than the 75th wage percentile.

The O*Net data results show significant changes in wages across driver categories. Although median hourly wages only increase for bus drivers ($0.88), school bus drivers, taxi drivers, and driver/sales workers experience statistically significant increases in the 25th percentile wage from between $0.70 and $1.00. School bus drivers also experience an increase of $1.29 in the 75th percentile wage. Somewhat paradoxically, we find a $0.43 reduction in the 25th and 75th percentile wages for heavy trucking, perhaps due to the shift towards lower paid self-employed drivers; however, this trend predates AUC sales and cannot be causally linked to AUC sales access. In summary, changes in demand for commercial drivers appear to exceed supply-side effects following AUC access. The only net effect potentially explained by a decline in the supply of drivers is among bus drivers, where employment declines and wages increase post-AUC start of sales.

Simple means comparisons for New Mexico (NM) do not illuminate much change in employment for commercial drivers before and after the legalization of AUC, but wages increase in several sectors. Tighter labor markets associated with AUC sales are likely contributing to current challenges in hiring public sector commercial drivers, as described by the NM DOT, as evidenced by persistent post-COVID job vacancies in the Albuquerque's ABQ Ride data (around 39% of positions for bus drivers at the end of 2024), and as shown by the statistically significant four-dollar increases in transit bus driver wages in New Mexico. However, the legalization of AUC in 2021 and start of sales in 2022 overlapped with the COVID pandemic, confounding identification.

Commercial drivers deliver goods to homes and stores, children to school, and employees to work, and their availability is essential for any sustained economic development or expansion. Their role in serving newly legal AUC markets is demonstrated in tightening labor markets for commercial drivers, with spillover effects to other industries hiring commercial drivers.

INTRODUCTION

Commercial driver shortages exist nationwide for all types of drivers, including long-haul trucking, commercial delivery, public transportation, and school bus service. Commercial truck shortages in the private sector are a main concern according to the American Transportation Research Institute (Ronan, 2023). Public sector shortages may be even worse; the American Public Transportation Association (APTA) reports that the shortage among public transit workers is “widespread and severe", with 96% of agencies reporting that they are facing shortages (APTA, 2023). In a call between the investigators and the New Mexico (NM) Department of Transportation (DOT) in Fall 2024, the NM DOT reported that they are facing shortages, because they cannot compete with the private sector wages and cannabis legalization has reduced the number of drivers eligible for hire as public transit workers. Meanwhile, legal adult-use cannabis (AUC) distribution may increase demand for commercial drivers further tightening the labor market for commercial drivers.

This study investigates whether cannabis legalization is a significant factor underlying driver shortages in NM and beyond. In 2021, NM legalized cannabis consumption by adults aged 21+, and in 2022, legal sales began through regulated dispensaries. As of January 2025, 24 states plus DC allowed for adult-use with legal dispensaries operational in 22 of the states. Another 14 states permit medical use only, and 9 states permit low tetrahydrocannabinol (THC)/high cannabidiol (CBD) products, which still exceed federal legal limits for THC. Cannabis has been shown to impair driving with particularly strong effects on the standard deviation of lane position, which is a measure of how well the driver stays centered in their lane. These effects dissipate, on average, about 5 to 7 hours after consumption in the case of 20 mg of inhaled THC, a common consumption amount (McCartney et al., 2021). Given the known impairment effects of THC, the United States (US) DOT requires that all safety-sensitive transportation employees be subjected to pre-employment, random, and post-accident drug testing for THC (CFR, 2024). Driving under a commercial driver’s license (CDL) requires pre-employment testing, random testing, and post-accident testing.

Although the effects of cannabis on driving wear off within hours, mandatory urine tests can detect cannabis up to 90 days after consumption with significant heterogeneity across cannabis users. The mismatch between impairment and detection means that commercial drivers in driving sectors that require drug-testing must abstain from cannabis entirely or risk testing

positive and losing their jobs. (Even in sectors without drug-testing, post-accident testing may be required.) As a result, cannabis legalization may reduce the availability of commercial drivers through reductions in new hires and retention. If minors are in the vehicle, e.g., on school buses, the penalties for testing positive for cannabis may be more severe (Bergal, 2020). The hypothesis that cannabis legalization will lead to driver shortages is further supported by the existing literature on trucking and cannabis use, which shows low frequencies of cannabis detection among truck drivers (Dini, 2019) or in truck-involved traffic accidents (Balthrop, 2024), suggesting that employment-based drug-testing protocols are effective at deterring cannabis consumption by truck drivers.

Meanwhile, on the labor demand side, legal cannabis is likely to increase demand for commercial drivers relative to illegal cannabis markets in several ways. Legal cannabis spawned a myriad of differentiated and increasingly sophisticated cannabis products requiring significant processing and packaging infrastructure. Large scale indoor grow facilities now supply the premium side of the product market; facilities which would have been far too easily detected for illegal growing due to significant electricity requirements. Regulatory testing and retail storefronts are entirely new, non-existent for illegal cannabis. Prior work has found increased employment in manufacturing and services in Colorado in response to AUC dispensary openings (Chakraborty et al., 2021), and in agriculture following AUC legalization using national Current Population Survey (CPS) data (Dave et al., 2025). This prior work primarily found increased employment rather than changes in wages, in line with beneficial increases in employment without adverse spillover effects to other industries from increased wages. Using data from Colorado and Washington, Jiang and Miller (2022) also find no impact on wages in retail and agricultural sectors.

No existing literature examines the effect of cannabis legalization on employment and wages among commercial drivers despite the current commercial driver shortage and the potential for cannabis legalization to affect both new hires and retention. This study seeks to fill that gap, generating generalizable measurements of the effect of cannabis legalization on commercial drivers. The empirical objective of the proposed research is to examine the causal effects of medical and recreational cannabis legalization laws on the labor market outcomes of commercial drivers. In general, we hypothesize that cannabis legalization will lead to an increase

in the demand for commercial drivers and a decrease in labor supply of eligible drivers, leading to upward pressure on wages and ambiguous effects on employment.

To test these hypotheses, we use state-by-year variation in medical and AUC legalization and dispensary access, with the current white paper focusing on AUC dispensary access, as the policy change most likely to affect access and drive demand for commercial drivers to distribute cannabis products. Cannabis legalization is measured using the legal effective dates, which remove consumption penalties and often allow home cultivation, and by whether dispensaries are operational in the state. Prior studies have found that dispensary access, i.e., access to a legal, regulated supply of cannabis, tends to have a larger effect than legalization of consumption alone (Pacula and Smart, 2020; Pedersen et al., 2021; Trangenstein et al., 2025). To establish causal relationships, we adopt a two-stage difference-in-differences model (Butts and Gardner, 2022). For outcome variables, we use individual-level survey data from the CPS on employment and wages by sector for trucking, busing, and taxi/chauffeuring (Flood et al., 2025); and we use state-by-year-level data from O*NET, which provides establishment-based data on employment and wage information by occupation and by sector for heavy trucking, light trucking, drivers/sales workers, public bus drivers, school bus drivers, and taxi/chauffeurs (National Center for O*NET Development, 2025). Medical and AUC legalization dates and start of sales dates were collected as part of NIH Grant No. R37DA058005 (NIH RePORTER, 2025). Because NM's cannabis legalization is collinear with the COVID pandemic, we cannot conduct a causal study of the effects of NM's legalization on commercial driving in NM directly, even using synthetic control methods, as all states in the donor pool of potential control states also would be affected by the COVID pandemic and the differential timing of COVID-related policies and the spread of the pandemic make it difficult to make reasonable assumptions about the sizes of pandemic effects. Therefore, we provide regression analyses across US states and provide descriptive statistics and means comparisons for NM.

Our results generally support our hypothesis that demand side effects will dominate supply-side effects, as shown in the CPS data by increases in the likelihood of full-time employment among self-employed taxi drivers (0.16 percentage points, $p<0.05$), increases in hours per week among truck drivers (22 minutes, $p<0.05$), and increased likelihood of self-employment (1.6 percentage points, $p<0.01$), especially among truck drivers (1.3 percentage points, $p<0.01$), combined with evidence of increased wages for self-employed taxi drivers

($2.66 per hour, p<0.1). The O*Net data, which focuses only on non-self-employed drivers, shows wage increases at the lower end of the wage distribution (25th percentile) for drivers/sales workers ($1.00, p<0.01), school bus drivers ($0.71, p<0.05), and taxi/chauffeurs ($0.70, p<0.01), without any corresponding statistically significant change in employment. School bus drivers experience wage increases for median hourly wage ($0.88, p<0.05) and for the 75th percentile wage ($1.29, p<0.05) as well. Reduced wages at the 25th and 75th percentile in heavy trucking (-$0.43, p<0.1) may be offsetting the increases among drivers and sales workers in the CPS data, for which these categories are combined. Event study results support the patterns found in the aggregated difference-in-difference results, while providing nuance to some of the results. The negative wage effects found for heavy trucking and light trucking and the positive wage effect found for drivers/sales workers in the O*Net data suffer from pre-trends, suggesting these wage reductions are not driven by AUC access. The event studies also provide the only evidence of supply-side impacts, and only for bus drivers, where a decline in the years post-AUC access is consistent with a reduction in the availability of school bus drivers. While this could be driven by school bus drivers switching to other sectors with increased demand for commercial drivers, school bus drivers earn more at baseline than drivers in all but heavy trucking and are experiencing the largest wage gains post-AUC access, supporting that supply side effects exist among school bus drivers.

As the first study on the effects of cannabis legalization on commercial driving, this work contributes to the broader literature on the employment effects of cannabis legalization, which typically finds increased employment in sectors impacted by the newly legal market, e.g., agricultural and service workers, with little negative supply effects evidenced. Commercial driving, unlike most sectors in the economy, is subject to significant drug testing, especially for drivers of larger commercial vehicles like buses and tractor-trailers. As such, this paper also contributes to the literature on employment drug testing by documenting a lack of impact from AUC on employment among commercial drivers, in line with industry reports showing very low detection rates among drivers. It also adds to the literature on the labor market effects of newly legal industries (e.g., gambling, Cotti, 2008; Humphries and Marchand, 2013), by finding evidence of broad, cross-sector impacts from the opening of a newly legal industry, extending beyond more obviously related industries to core economic functions, including the transportation of goods and services. The results herein also support the literature on labor

market outcomes in the U.S. trucking industry, which documents distributional shifts across driving occupations, suggesting that commercial driving sectors respond to demand shocks, not just through top-line shifts in employment and wages but through changes in self-employment, hours worked, and changes in the distribution of wages (Burks & Monaco, 2019; Miller et al., 2023). Shifts in the tails of the wage distribution suggest that significant heterogeneity exists among drivers within the broad sectors of drivers/sales workers and truck drivers, bus drivers, and taxi/chauffeurs.

This research is relevant for NM's economic development because commercial driver shortages slow and even stop the transportation of goods and people, which affects all sectors of the economy. Tying into the University of New Mexico's 2040 goals, this research (1) addresses a critical issue facing NM, as described by the NM DOT and validated by the broader literature; (2) involves research with direct implications for economic development in NM; (3) could be a force to improving social justice and equity because many low-income individuals depend on public transportation to get to their jobs, school, and healthcare appointments, and to obtain basic necessities like food; and (4) has engaged stakeholders, including our existing NM DOT contacts, as well as public safety stakeholders, who have provided crucial information on the challenges in testing for driving impairment.

HYPOTHESIS DEVELOPMENT

Commercial drivers work in several distinct subsectors in the economy and AUC access may have different effects across these sectors depending on demand-side effects and the extent of drug testing. Figure 1 uses a simple supply-and-demand framework to break out the hypothesized effects on wages and employment for each commercial driving subsector: school bus drivers, transit bus drivers, taxi/chauffeurs, drivers/sales workers, light truckers, and heavy truckers. As shown, we expect industries like bus driving and heavy trucking to show declines in supply due to extensive drug-testing. Because taxi/chauffeur, drivers/sales worker, and light trucking do not require a commercial driver's license and are not typically drug tested, we do not anticipate any significant supply-side effects for these occupations. For demand, we do not expect that the new AUC industry will increase demand for school bus drivers or heavy truckers, especially with current constraints on interstate commerce due to federal prohibitions. Major demand impacts are more likely in taxi/chauffeur, drivers/sales workers, and light trucking,

which are needed for transporting wholesale and retail products for delivery. Transit drivers and taxi/chauffeurs may experience a slight increase in demand from people who prefer to hire a driver rather than drive intoxicated. These varying supply and demand factors lead to unambiguously predicted increases in wages but different employment effects across sectors. Employment is expected to decrease among school bus drivers and in heavy trucking and expected to increase among taxi/chauffeur, drivers/sales workers, and light trucking due to increased demand for types of drivers by the AUC industry.

Our primary data set, the CPS, does not include all six occupational sectors. Instead, it collapses the six categories into three: bus drivers (school and transit), taxi/chauffeur, and truck drivers (drivers/sales workers, light trucking, and heavy trucking). As such, the wage effects in these more aggregated sectors are still unambiguously predicted to be greater than zero. For bus drivers, the combined effect on employment is still anticipated to be negative. The taxi/chauffeur category remains unchanged in that increased employment is predicted. For trucking, however, hypothesized effects on employment work against each other with reduced employment in heavy trucking but predicted increased employment in light trucking and for drivers/sales workers.

An additional nuance to the labor market for commercial driving is the effect on self-employed versus non-self-employed drivers. Self-employed drivers are less likely to be subject to drug-testing unless required by law, and simultaneously, large corporate operators may see using more self-employed drivers as a way to offload increased potential risk from impaired drivers. As such, we would expect an increase in demand absent a significant increase in supply, leading to higher wages among the self-employed and increased self-employment.

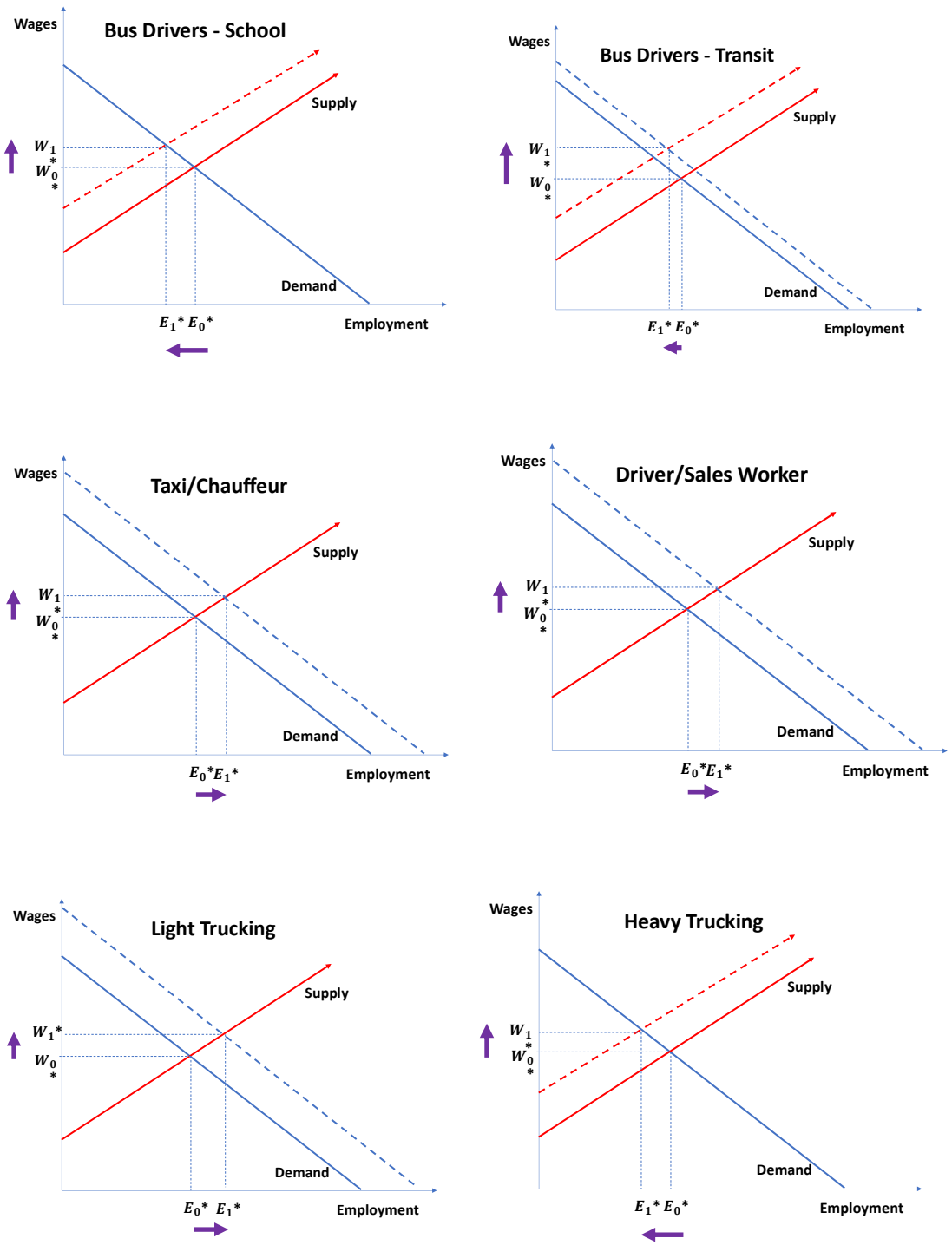


Figure 1: Hypotheses by Sector. E=Employment, W=Wages, 0=pre-AUC access, 1=post-AUC access

DATA

This study focuses on the effects of cannabis legalization on the population of commercial drivers in the United States, covering the period from 2000 to 2024. Because the impacts on New Mexico are a driving motivation for this research, we also explore the relationship between AUC legalization and labor market outcomes in New Mexico, specifically. Because of the econometric sample-size requirements, we are only able to estimate causal relationships for the national sample; means comparisons are provided for labor markets pre-/post-legalization in New Mexico. We use three primary data sources: cannabis legalization events collected as part of NIH Grant No. R37DA058005 (RePORTER, 2026), individual-level labor market outcomes from the Current Population Survey (CPS) (Flood et al., 2025), and occupation-based employment and wage outcomes from O*NET (National Center for O*NET Development, 2025). All legalization dates were documented by obtaining the signed legislation or approved ballot initiatives and all start of sales dates were validated using at least one national news outlet or at least two local news outlets. Figure 2 shows the progression of legalization events over time, with this white paper focusing on the opening of dispensary sales as our treatment variable. Figure 3 maps the first year each state opened recreational dispensaries. States in the Mountain West and Pacific Northwest tended to adopt earliest, while very few Southern states have not adopted at all.

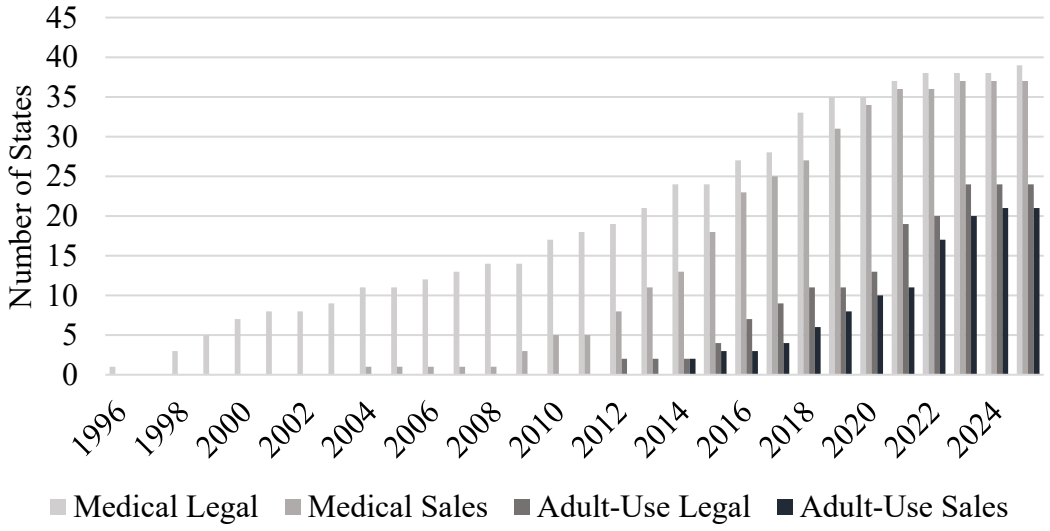


Figure 2: Legalization and Start of Sales Dates over Time

Notes: Figure 2 shows the number of states with legal medical cannabis, legal AUC, medical dispensary sales, and AUC dispensary sales. These data were collected as part of NIH Grant No. R37DA058005 (RePORTER, 2026).

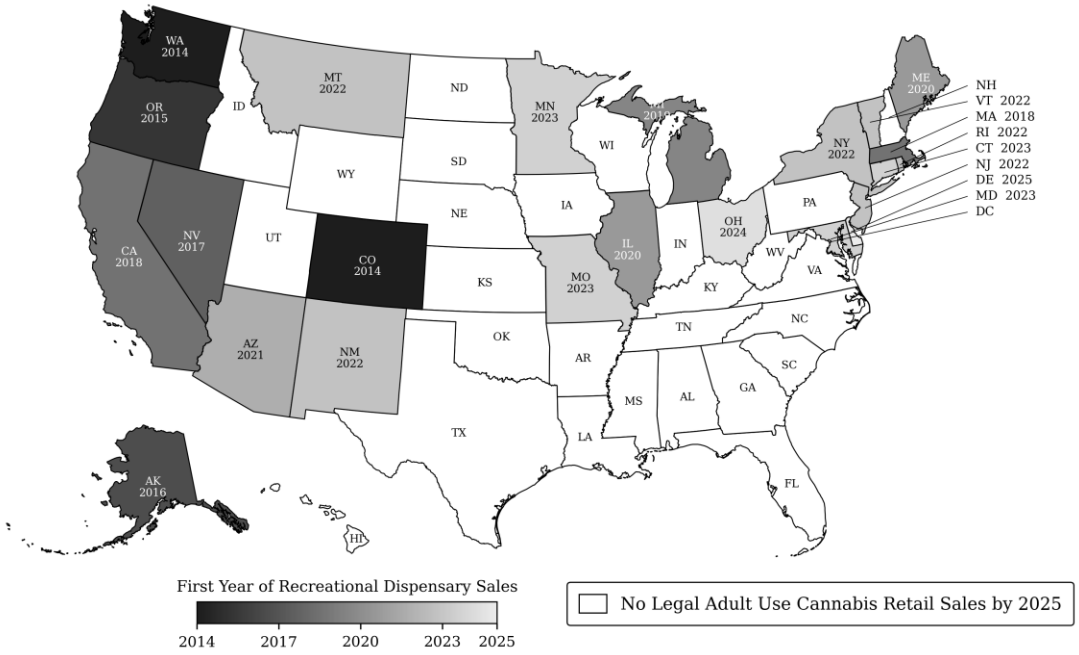


Figure 3: National Map with Legal Recreational Cannabis Dispensary Sales (by 2025)

Notes: Map reports the first year of legal recreational cannabis dispensary sales by state, based on cannabis legalization events collected as part of NIH Grant No. R37DA058005 (RePORTER, 2026). States are shaded on a grayscale gradient from darkest (earliest adoption year as of 2014) to lightest (latest adoption as of 2025), and states with no legal adult-use retail sales by 2025 are left blank. Virginia is classified as a never-adopted state because it legalized possession and home cultivation but has not opened a retail market. Washington, D.C. is excluded as it does not allow for conventional AUC retail sales. Delaware's dispensary sales began in 2025, after the end of the sample period, and therefore, contributes no post-treatment observations to the empirical analysis despite being shown here.

We use CPS data to track the shifts and changes in demographics and labor market outcomes for working age individuals (18-64 years old) after the cannabis legalization. The CPS is a monthly household survey conducted by the U.S. Census Bureau for the Bureau of Labor Statistics (BLS) to generate labor market and demographic statistics, covering approximately 60,000 scientifically selected households every month. Along with labor force outcomes, the

survey records demographic information including age, sex, race, ethnicity, education, marital status, household size, and geographic information including state of residence.

For the CPS data analysis, we construct a driver sample using IPUMS CPS microdata from 2000 to 2024. Because CPS occupation codes change over time, we crosswalk driver occupation codes from 2000 to 2024 to a consistent set of driver categories. The CPS analysis focuses on three broad commercial driver categories: driver/sales workers[1] and truck drivers ("truck"), bus drivers ("bus"), and taxi drivers/chauffeurs ("taxi"). CPS occupation coding follows three distinct classification systems over our sample period, corresponding to 2000-2002, 2003-2019, and 2020-2024. For 2000-2002, occupation codes 804 and 806 are combined into the truck category, code 808 is assigned to bus, and code 809 is assigned to taxi. For 2003-2019, code 9120 maps to bus, 9130 maps to truck, and 9140 maps to taxi. For 2020-2024, code 9130 maps to truck, codes 9121 and 9122 are combined into bus, and code 9142 maps to taxi. After this mapping, each worker-year observation falls into one of the three harmonized categories regardless of which underlying coding system was in use, which allows us to build a consistent occupation panel across the full 2000-2024 period.

The analysis sample is restricted to working age individuals (ages 18-64) in the 50 U.S. states and the District of Columbia, excluding U.S. territories such as Puerto Rico, Guam, and the U.S. Virgin Islands. We create individual-level employment and wage variables as follows. For employment, we construct a {0,1} variable for whether that person was employed as a driver, conditional on being employed, or in a specific category of driver, conditional on being employed, at the time of the interview. We construct an additional binary variable capturing whether the person works full-time, defined by working more than 35 hours per week, and include their usual hours worked per week as a continuous outcome variable. We also analyze whether respondents are self-employed or working for someone else, using a {0,1} measure where one equals self-employed, taken from the CPS class-of-worker variable. To calculate hourly wage, CPS weekly earnings are divided by usual hours worked, adjusted for inflation to 2015 dollars using the Consumer Price Index, and capped at $200. We calculate weekly earnings differently for self-employed and non-self-employed drivers because earnings are reported differently across these groups. For non-self-employed drivers, hourly wages are calculated by

[1] These driver/sales workers are primarily delivery drivers. Although their role involves sales tasks, they are driving a vehicle to deliver goods along established routes and collect payment for the goods they deliver.

dividing self-reported weekly earnings by usual hours worked per week. For self-employed drivers, weekly earnings are estimated by dividing annual business income by 52 weeks, and hourly wages are then calculated by dividing estimated weekly earnings by usual hours worked per week. We also construct variables for whether an individual is below the 25th percentile of wages or above the 75th percentile of wages using wage distribution percentiles extracted from the O*Net data and harmonized by occupation x state x year.[2] Descriptive statistics for the CPS data are presented in Table 1. Our employed, working age sample consists of 18,875,978 observations, which includes 482,757 observations for individuals reporting a driving occupation with 384,999; 60,007; and 37,751 observations for the truck, bus, and taxi driver subgroups, respectively.

Table 1: CPS Driver Sample Summary Statistics

Outcome Variable	Mean (SD)	Mean (SD)	Mean (SD)
Panel A. Likelihood of Being a CDL Driver Among Working Age Population			
Pr (Being a Driver)	0.0256(0.1686)		
	Truck Drivers	Bus Drivers	Taxi Drivers
Pr (Driver by Occupation)	0.0211 (0.1503)	0.0035 (0.0592)	0.0010 (0.0514)
N of Working Age Population	18,875,978		
Panel B: Labor Market			
Hourly wage adjusted (2015 USD)	18.70 (9.65)	17.28 (9.66)	16.09 (10.74)
Full-time (=1)	0.925 (0.264)	0.683 (0.465)	0.826 (0.379)
Weekly hours worked	44.11 (11.61)	35.05 (9.77)	39.99 (12.53)
Pr (Below 25th Percentile)	0.320 (0.467)	0.299 (0.458)	0.245 (0.430)
Pr(Above 75th Percentile)	0.259 (0.438)	0.289 (0.453)	0.403 (0.491)
Self-employed (=1)	0.110(0.313)	0.015(0.122)	0.270(0.444)
Panel C: Demographics			
Age	42.429 (11.976)	47.141 (10.931)	43.602 (11.817)
Female (=1)	0.059 (0.235)	0.510 (0.500)	0.153 (0.360)

[2] In cases where O*Net data report more refined driver groups, distributional wage data are calculated using the weighted means of the wages from corresponding groups. Group specific employment levels are used as weights.

Married (=1)	0.606 (0.489)	0.611 (0.487)	0.554 (0.497)
White (=1)	0.790 (0.407)	0.658 (0.474)	0.543 (0.498)
Black (=1)	0.159 (0.366)	0.291 (0.454)	0.282 (0.450)
Other race (=1)	0.051 (0.220)	0.051 (0.221)	0.175 (0.380)
College or more (=1)	0.067 (0.251)	0.093 (0.290)	0.206 (0.405)
N	384,999	60,007	37,751

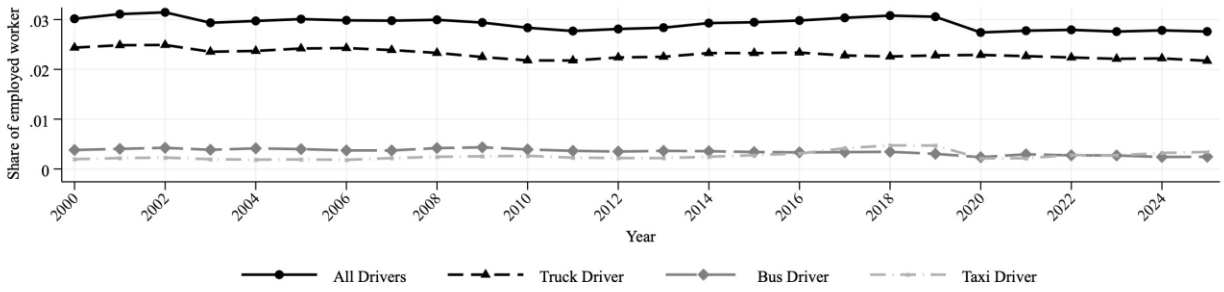
Notes: Data are from the CPS Outgoing Rotation Group, 2000-2024, restricted to employed workers ages 18 to 64. Hourly wages are adjusted to 2015 dollars using the CPI and top-coded at $200. Full-time equals one if usual weekly hours worked are 35 or more. Self-employed equals one if class of worker is coded 13 or 14. Race categories are mutually exclusive. College or more equals one if the respondent holds a bachelor's degree or higher. Standard deviations are reported in parentheses.

From the analysis sample, 2.56% of the CPS employed, working age population is working as a driver. Among drivers, the truck subgroup accounts for 79.75% of drivers, the bus driver subgroup accounts for 12.43% of drivers, and the taxi group accounts for 7.82% of drivers. Truck drivers have the highest average hourly wage at $18.70, highest self-reported usual work hours per week at 44.11 hours, and the highest rate of full-time employment (defined as working 35 or more hours per week) at 92.5 %. Taxi drivers are the lowest paid at $16.09 per hour with a 40-hour work-week average, but with only 83% considered full-time. Bus drivers make $17.28 but are much less likely to work full time (68%) and typically work only 35 hours per week. With respect to self-employment, taxi drivers are most likely to be self-employed at 27%, with truck drivers at 11% and bus drivers at 1.5%. Taxi drivers earn the least on average, but they're most likely to earn above the 75th percentile hourly wage of their wage distribution (40.3%), versus 25.9% for truck drivers and 28.9% for bus drivers. They're also less likely to fall below the 25th percentile than truck drivers (24.5% vs. 32.0%). So even with a lower average hourly wage, taxi drivers get paid more spread out than the other two driver groups. Notably, the wage distribution in O*Net data and CPS data don’t match perfectly. The CPS sample appear to have higher rates of reporting wages below 25th percentile or above 75th percentile. This discrepancy may be driven by reporting errors in the individual data, the differences in wage calculation by individuals vs. employers, or differences in the sampling strategy by CPS vs.

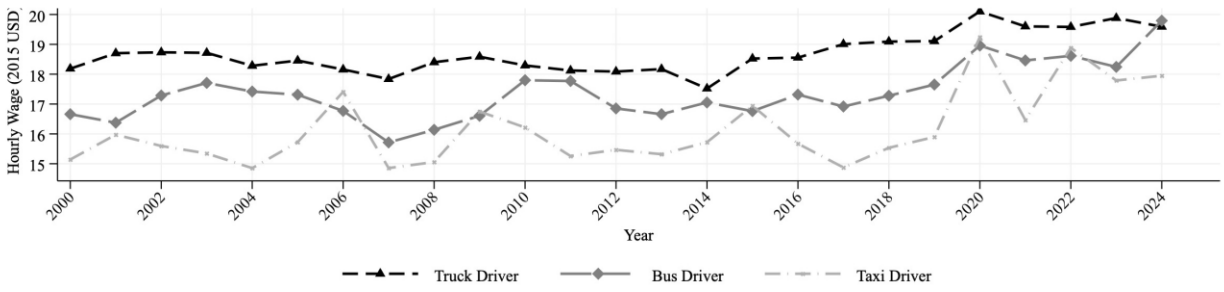
O*Net. Without more information to help us fully understand this discrepancy, we conduct analyses using both datasets.

Turning to demographic characteristics, bus drivers are the oldest subgroup, are far more likely to be female at 51% versus 5.9% for truck drivers and 15.3% for taxi drivers. All subgroups are majority White but truck drivers are most likely to be White and least likely to be of another race. Taxi drivers are significantly more educated than the other two driver subgroups with more than 20% holding more than a college degree versus less than 10% for the other two subgroups.

Comparing trends in wages overall and by subgroup, Figure 4 Panel A shows the trends for the likelihood of employment in each commercial driving occupation, 2000-2024. Being employed as a truck driver has the highest likelihood throughout, falling from about 2.5 percent to 2.2 percent. Bus and taxi drivers stay below 0.5 percent for the full period. The likelihood of being employed as any type of commercial driver falls from about 3 percent to about 2.8 percent. Panel B shows real average hourly wages for the CPS driver sample during 2000-2024, weighted by CPS individual weights. Truck drivers earn the highest throughout and show the smoothest trend, rising from about $18/hour in 2000 to $20/hour by 2024, with a dip around 2014. Bus and taxi driver wages are lower and much noisier year to year, which reflects smaller CPS sample sizes for these occupations. Both occupations' average hourly wage increased after 2018 and reached roughly $19/hour for bus drivers and $18/hour for taxi drivers by 2024.



Panel A: Trend in Probability of Being a Commercial Driver



Panel B: Hourly Wage Trend by Driver Type

Figure 4: Probability of Driver Employment and Average Hourly Wage Trends by Driver Occupation (CPS)

Notes: Data are from the CPS accessed through IPUMS, 2000-2024, restricted to employed workers ages 18-64. Occupation codes are harmonized across the 2000-2002, 2003-2019, and 2020-2024 CPS coding schemes. Panel A shows the trends in probability of being a commercial driver, and Panel B shows the trends of average hourly wage by driver type.

The second dataset on employment and wages comes from Occupational Information Network, also known as O*Net (National Center for O*NET Development, 2025). The O*Net data provide occupation-level employment and hourly wages, which are collected from surveys of workers at selected employers and establishments by the U.S. Department of Labor's Employment and Training Administration (USDOL/ETA). Employers are selected for the O*NET program through a statistically random, two-stage sampling process: first by selecting business establishments that employ targeted occupations, and subsequently, by randomly sampling individual workers within those establishments. The data are aggregated at the state-year-occupation level. Relative to the CPS, an advantage of the O*Net dataset is that the sampling process is based on establishment distribution rather than worker demographic

characteristics. As such, the O*Net dataset provides a more accurate characterization of the distribution of employment outcomes including wage and employment levels.

The driver sample is restricted to the 50 U.S. states and the District of Columbia, excluding U.S. territories including Puerto Rico, Guam, and the U.S. Virgin Islands. The driver occupations include six occupation groups: Driver/Sales Workers, Heavy and Tractor-Trailer Truck Drivers, Light Truck Drivers, Transit and Intercity Bus Drivers, School Bus Drivers, and Taxi Drivers/Chauffeurs. These occupations are selected as they are major segments of the commercial driving industry. We exclude ambulance drivers and attendants (except EMTs) and "all other" motor vehicle operators from the analysis. Using these detailed occupation groups allows the analysis to compare employment and wage trends across different types of driving jobs, including freight transportation, passenger transportation, school transportation, and taxi/chauffeur services. Table 2 shows descriptive statistics for employment and wages by occupation. The total number of drivers in an average state-year is 73,311. Heavy truck drivers account for the largest employment at more than 33,000 drivers, while school bus drivers and taxi drivers/chauffeurs total less than 3,500 drivers in an average state-year. Heavy truckers have the highest wages, while drivers/sales workers and taxi drivers/chauffeurs have the lowest wages. The variation across subgroups in employment and wages point towards potential identification issues in the CPS data as the highest paid and lowest paid driver categories are combined in the truck subgroup.

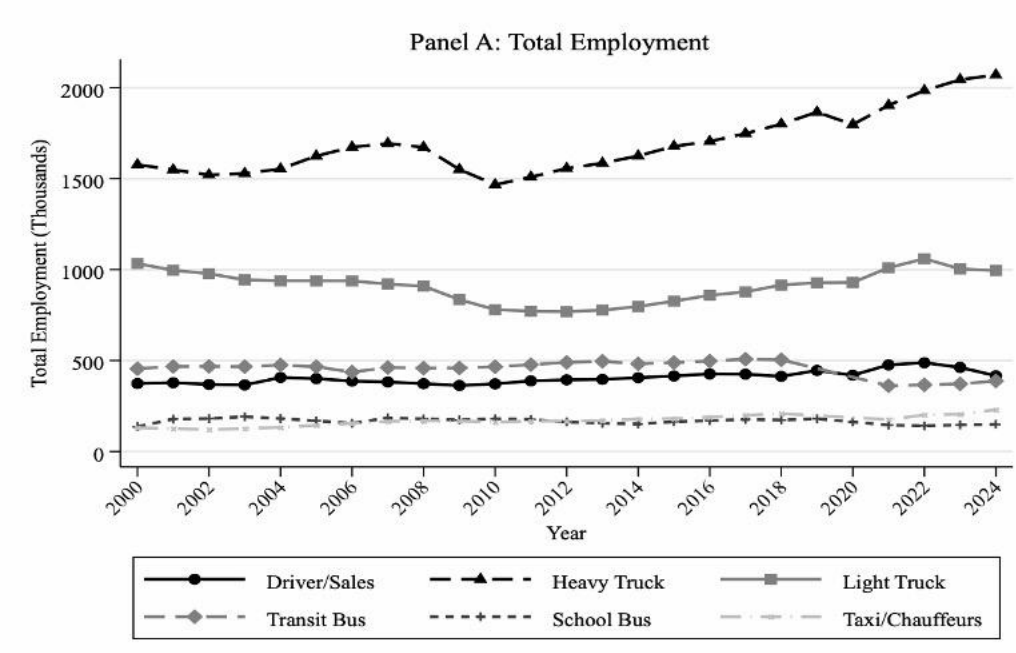
Table 2: O*NET Summary Statistics

	Employment		25th Pctile Wage		Median Wage		75th Pctile Wage	
Occupation	Obs	Mean (SD)	Obs	Mean (SD)	Obs	Mean (SD)	Obs	Mean (SD)
Driver/Sales Workers	1,265	8,017.68 (8,613.80)	1,275	9.40 (1.39)	1,274	12.18 (2.08)	1,275	17.57 (2.35)
Heavy and Tractor-Trailer Truck Drivers	1,275	33,111.50 (32,062.02)	1,275	16.38 (1.79)	1,275	19.92 (1.86)	1,275	24.47 (2.01)
Light Truck Drivers	1,275	17,812.55 (19,279.17)	1,275	11.43 (1.41)	1,275	14.80 (1.60)	1,275	19.60 (2.14)

Bus Drivers, Public Transit	1,156	9,091.25 (8,960.85)	1,167	11.91 (2.57)	1,167	14.44 (2.92)	1,167	17.17 (3.26)
Bus Drivers, School	1,211	3,435.51 (5,114.84)	1,235	13.41 (2.78)	1,235	16.82 (3.76)	1,235	20.95 (4.48)
Taxi Drivers and Chauffeurs	1,168	3,311.11 (3,708.05)	1,171	9.72 (1.24)	1,171	11.42 (1.54)	1,171	13.89 (2.25)

Notes: O*NET data pooled across 2000-2024. Employment is total occupational employment and summed across states in each state-year. Wages are hourly wages in 2015 dollars. Standard deviations are in parentheses. Employment and wage estimates of O*Net online are sourced from BLS OEWS and suppressed independently based on sample size to protect respondent confidentiality. So observations may differ across columns for the same occupation. Wages are hourly wages adjusted in 2015 dollars. Standard deviations are in parentheses.

Figure 5 shows how employment (Panel A) and median hourly wages (Panel B) evolve over time for six commercial driver occupations from 2000 to 2024. Heavy truck drivers make up the largest driver occupation group throughout the sample period, followed by light truck drivers. Employment in heavy truck drivers increases significantly after 2010, while employment in light truck, public transit bus, school bus, driver/sales, and taxi/chauffeur occupations remains relatively smaller and stable. Median hourly wages differ in levels across subgroups, but general trends are fairly similar over time. School bus drivers experienced the largest increase over time.



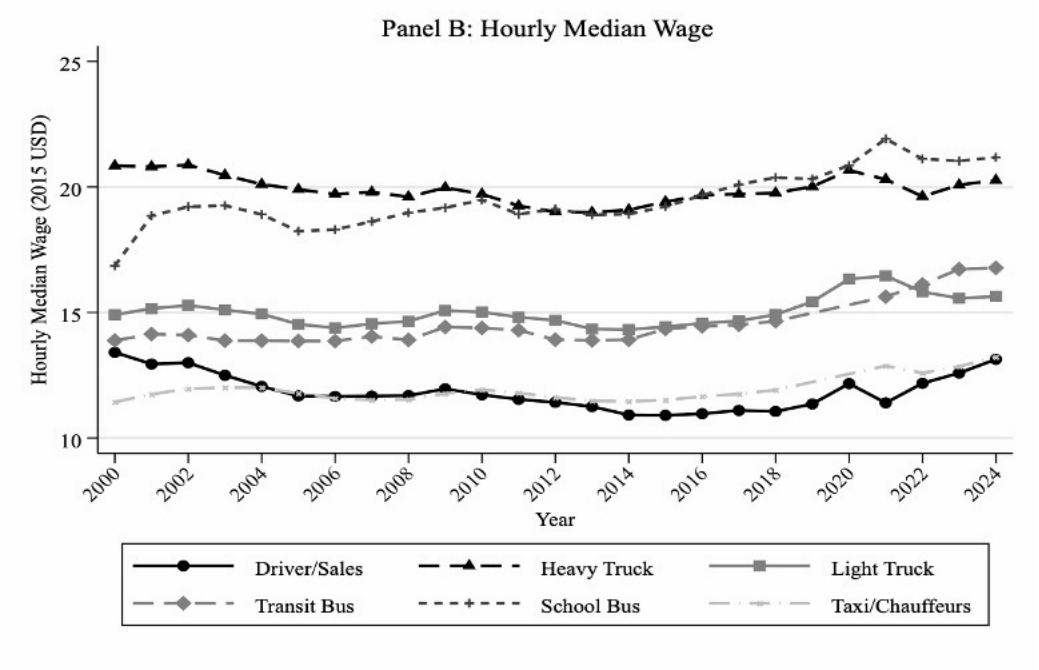


Figure 5: Employment and Average Hourly Wage Trends by Driver Occupation (O* Net)

Notes: Panel A shows total employment trends by driver occupation based on 2000-2024 O*Net data. Panel B shows the average weekly wage trends by driver occupation adjusted to the 2015 dollar based on the 2000-2024 O* NET.

EMPIRICAL METHODS

To estimate the effects of recreational cannabis legalization on commercial drivers, this study compares outcomes before and after the start of AUC dispensary sales. However, simply running a standard difference-in-differences model can lead to bias and inconsistency because it compares early-treated groups with late-treated groups rather than untreated groups (Goodman-Bacon, 2021). Therefore, we use the two-stage DiD estimator proposed by Gardner (2021) and implemented in Stata (did2s) by Butts and Gardner (2022). The Gardner (2021) model addresses the potential bias and inconsistency from staggered treatment timing through a two-stage estimation approach and allows us to control for state fixed effects, year fixed effects, and control variables including age, sex, marital status, and education. In the first stage, the following regression is estimated using only untreated observations from years before states' AUC dispensary sales started (untreated and not-yet-treated observations) and regressing outcomes on

all variables (fixed effects and controls) except for the treatment variable of interest, the time-varying start of AUC dispensary sales.

$$Y_{ist} = \alpha_s + \gamma_t + \beta_1 EducGroup_{ist} + \beta_2 Sex_{ist} + \beta_3 Married_{ist} + \beta_4 Age_{ist} + \beta_5 Age_{ist}^2 + \varepsilon_{ist} \quad (1)$$

where Y_{ist} is the outcome variable for individual *i* in state *s* in year *t,* α_s is the state fixed effect, and γ_t is the year fixed effect. The other terms in the equation are individual-level control variables, including education group (college or more than college), sex, marital status, and age along with a quadratic term for age. Using only untreated observations in the first stage means the fixed effects and covariates are estimated without being affected by the treatment itself, which avoids the bias and inconsistency in standard two-way fixed effects estimates under staggered timing. The Stage 1 estimates $\widehat{\alpha_s}$, $\widehat{\gamma_t}$, $\widehat{\beta_n}$ (where *n* equals one to five) are used to predict counterfactual outcomes $\widehat{Y_{ist}}$ for all observations. Residualized outcomes, $\widetilde{Y_{ist}} = Y_{ist} - \widehat{Y_{ist}}$, are then constructed by subtracting the predicted outcome based on the first-stage estimates from the observed outcome. The second stage then regresses the residualized outcomes on our {0,1} treatment variable for the start of AUC dispensary sales. For our main results, we use a simple comparison of pre- and post-start of AUC dispensary sales in the second stage.

$$\widetilde{Y_{ist}} = \theta Disp_{st} + \nu_{ist} \quad (2)$$

Included in the Appendix are event studies mapping five treatment leads and lags for our main results, using the following specification:

$$\widetilde{Y_{ist}} = \sum_{k=-5, k\neq -1}^{5} \delta_k 1[RelYear_{ist} = k] + \nu_{ist} \quad (3)$$

The indicator $1[RelYearist = k]$ equals one if individual *i* in state *s* at time *t* is *k* years away from their state's dispensary opening, and zero otherwise. We estimate for $k = -5$ through $k = 5$, omitting the year before recreational cannabis dispensary, using $k = -1$ as the baseline reference period. Never-treated states are coded as zero on every event time indicator instead of being given their own value or leaving it missing, so they serve as part of the comparison group

in the second stage. Coefficients before treatment ($k < -1$) measure anticipatory effects and test whether pre-trends are parallel, and coefficients after treatment ($k \geq 0$) give the dynamic effect in each year following the start of AUC dispensary sales. In both the pre/post and event study specifications, standard errors are clustered at the state level indicating that treatment ($Disp_{st}$) is assigned at the state level. Sample weights are included in both first and second stages to ensure population representativeness as much as possible.

RESULTS

Tables 3 and 4 present our employment results for the CPS data. Table 3 reports the likelihood of being a driver, overall and by sector; being employed full-time; and being self-employed. None of the results in Panel A and B are statistically or economically significant. However, in Panel C, we find that self-employment increases in our overall sample by 14% or 1.6 percentage points (p<0.01), driven by the truck driver subgroup (1.3 percentage points, p<0.01).

Table 3: Effects of AUC Access on CPS Employment Outcomes

	(1) Truck Driver	(2) Bus Driver	(3) Taxi Driver	(4) All Drivers
	A. Probability of Being a Driver (among all occupations)			
ATT	-0.000432	-0.000205	0.000145	-0.000493
	(0.000685)	(0.000150)	(0.000220)	(0.000897)
	17, 234,504	17, 234,504	17, 234,504	17, 234,504
	B. Probability of Full-Time Status			
ATT	0.000500	-0.0014	-0.0069	-0.0025
	(0.0029)	(0.0123)	(0.0130)	(0.0036)
Observations	345,356	56,096	33,143	434,595
	C. Probability of Self-Employment			
ATT	0.0129***	-0.0043	-0.0191	0.0160***
	(0.0047)	(0.0033)	(0.0193)	(0.0048)
Observations	384,314	60,007	32,990	477,311

Notes: ATT estimated via the Gardner (2021) two-stage difference-in-differences estimator using CPS microdata, 2000–2024. Panel A is estimated on the full sample of employed workers age 18-64, and the outcome is whether the individual works in the relevant occupation, so the sample size N is larger than the subsamples Panel B and Panel C. Panels B and C are estimated on subsamples which are workers employed in the relevant driver occupation, so N varies by column. Panel B reports the change in the probability of self-employment conditional on driver employment. Standard errors clustered at the state level are reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Given the significant increase in self-employed drivers in Table 3, Table 4 shows changes in full-time likelihood and usual hours worked for self-employed and non-self-employed drivers. For the likelihood of working full-time, we find a 0.16 percentage point (2%) increase ($p<0.05$) among self-employed taxi drivers. For the usual hours worked, we find a 0.8% or about 0.4 hours ($p<0.05$) increase in the usual hours worked among truck drivers who are not self-employed.

Table 4: Effects of AUC on CPS employment outcomes

	(1) Bus Driver	(2) Truck Driver	(3) Taxi Driver	(4) Bus Driver	(5) Truck Driver	(6) Taxi Driver
	Not Self-Employed			Self-Employed		
	Panel A: Usual Hours Worked					
ATT	0.2141	0.3586**	−0.5755	−1.4477	−0.175	0.0401
	(0.3477)	(0.1527)	(0.7079)	(3.4035)	(0.6195)	(1.2134)
	Panel B: Full-time Status					
ATT	−0.0002	−0.0005	−0.0000	−0.0001	0.0020	0.0016**
	(0.0002)	(0.0007)	(0.0002)	(0.0002)	(0.0022)	(0.0008)
Observations	70,049	334,940	29,472	1,006	41,543	10,120

Notes: ATT estimated using the Gardner (2022) two-stage difference-in-differences estimator using CPS microdata, 2000-2024. Outcome is usual hours worked per week. Standard errors clustered at the state level are reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

Event studies, shown in Appendix Figures 1 to 5, support the patterns found in Tables 3 and 4. The event study for bus drivers shows potential decreases in employment and in usual hours

worked around Year 3 post-legalization that later reversed, in line with the statistically insignificant pre/post estimates. The most significant patterns suggest an increase in self-employment primarily driven by truck drivers. Subsample analyses by self-employment status also show that self-employed truck drivers increased the usual hours worked.

Given the large increase in self-employment among truck drivers, we report the remainder of the results by self and non-self-employed workers separately, except for bus drivers. For bus drivers, self-employment represents less than 1.5% of the sample, so we omit those observations and only analyze non-self-employed bus drivers when looking at wage outcomes, which are only reported in a quarter of the sample resulting in small sample sizes.

Table 5 reports results for average hourly wage, the likelihood of earning below the 25th percentile wage or above the 75th percentile wage (as defined by O*Net). The results in Panel A for average hourly wage are statistically insignificant, but self-employed taxi drivers experience a marginally statistically significant increase of $2.66 ($p<0.1$). In Panel B and C, we see corresponding marginally significant reduction of 22.4 percentage points ($p<0.1$) in the likelihood of taxi drivers working for less than the 25th percentile wage and a statistically significant 23.8 percentage point increase ($p<0.05$) in the likelihood of earning above the 75th percentile wage. The event studies (Appendix Figures 6 and 7) show similar patterns as well as short-term shifts in the truck sector shortly after AUC dispensary entry as evidenced by a decline in the likelihood of earning below the 25th percentile in the first year after the start of AUC sales that is mirrored by an increase in the likelihood of earning above the 75th percentile wage.

Table 5: Effects of AUC on the Probability of Wage Distribution and Average Hourly wage (CPS)

	Not Self-employed			Self-employed		
	(1) Bus Driver	(2) Truck Driver	(3) Taxi Driver	(4) Bus Driver	(5) Truck Driver	(6) Taxi Driver
			Panel A. Average Hourly Wage			
ATT	0.0626	−0.0344	0.5170	-	−0.824	2.6594*
	(0.3865)	(0.2524)	(0.5145)		(2.1623)	(1.5709)

Panel B. Probability of Wage Below the 25th Percentile Benchmark						
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.0100	0.0075	-0.0312	-	-0.0657	-0.2244*
	(0.0394)	(0.0146)	(0.0537)		(0.0637)	(0.1364)
Panel C. Probability of Wage Above the 75th Percentile Benchmark						
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.0277	-0.0082	-0.0447	-	-0.0271	0.2382**
	(0.0375)	(0.0108)	(0.0496)		(0.0480)	(0.0942)
Observation	16,951	82,191	7,194		2,624	784

Notes: ATT estimated via the Gardner (2022) two-stage difference-in-differences estimator using CPS microdata cross-walked and harmonized with O*NET occupation-state-year wage benchmarks, 2000-2024. Panel A reports the average hourly wage effects. Panel B reports the change in the probability that an employee's hourly wage falls below the 25th percentile benchmark for their occupation, state, and year. Panel C reports the change in the probability that an employee's wage falls above the 75th percentile benchmark. The ATT for bus driver occupations is omitted because of small sample size (only 65 observations in the sample). ATT and standard errors are reported in probability units (proportion of workers, 0 to 1). Standard errors clustered at the state level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To summarize, the CPS data suggest increases in self-employment among truck drivers, increased likelihood of full-time employment among self-employed taxi drivers, and increased usual hours worked among truck drivers, who are not self-employed. Sustained wage effects are at best marginally significant.

The O*Net results for the natural log of employment, median wages, and the level of the 25th and 75th wage percentiles are reported in Tables 6 and 7. The employment results in Table 6 show no statistically significant effects from the start of AUC dispensary sales on the number of drivers employed in any of the driving subgroups. The corresponding event study in Appendix Figure 8 shows no obvious changes after the start of AUC sales.

Table 6: Effects of AUC on O*NET Log Employment by Occupation

	Driver/Sales Workers	Heavy and Tractor-Trailer	Light Truck Drivers	Bus Drivers,	Bus Drivers, School	Taxi Drivers and Chauffeurs

		Truck Drivers		Public Transit		
ATT	0.0510	0.0150	−0.0140	0.0160	−0.0130	−0.0090
	(0.0580)	(0.0310)	(0.0410)	(0.0480)	(0.0540)	(0.0950)
Observations	1,265	1275	1275	1156	1211	1168

Notes: Estimates are average treatment effects on the treated (ATT) from the Gardner (2022) two-stage difference-in-differences estimator. Standard errors are in parentheses. Standard errors clustered at the state level are reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

The wage results reported in Table 7 show more evidence of changes associated with the start of AUC dispensary sales. Median wage increases among school bus drivers by $0.88 (p<0.05) with increases at both the 25th ($0.71, p<0.05) and the 75th ($1.29, p<0.05) percentiles. Taxi drivers also experience an increase of $0.70 in the 25th percentile wage (p<0.05). The event studies in Appendix Figures 9-11. The additional statistically significant results in Table 7 (lower wages at the 25th percentile among heavy trucks, and higher wages at the 25th percentile among drivers/sales workers, and lower wages among heavy truck drivers at the 75th percentile) suffer from pre-trends in the event studies show in Appendix Figures 10 and Figure 11. The event studies also illuminate short-term shifts that are noisy or off-set each other, such as an increase in median hourly wages among taxi drivers three years after the start of AUC sales, higher wages at the 25th percentile among light truck drivers and transit bus drivers, and decreased wages among transit drivers at the 75th percentile level, suggesting markets go through an adjustment period post-start of AUC sales.

Table 7: Effects of AUC on O*NET Hourly Wage by Wage Percentile

	(1)	(2)	(3)	(4)	(5)	(6)
	Driver/Sales Workers	Heavy and Tractor-Trailer Truck Drivers	Light Truck Drivers	Bus Drivers, Public Transit	Bus Drivers, School	Taxi Drivers and Chauffeurs
			A. on 25th Percentile Hourly Wage			
ATT	0.9985***	-0.4346**	0.2542	0.2183	0.7145**	0.7038***

	(0.3082)	(0.1973)	(0.1801)	(0.3536)	(0.3160)	(0.2511)
Observations	1275	1275	1275	1167	1235	1171
			B. on Median Hourly Wage			
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.3051	0.0620	-0.0013	-0.0723	0.8843**	0.0451
	(0.3776)	(0.2908)	(0.1725)	(0.4265)	(0.3787)	(0.2627)
Observations	1274	1275	1275	1154	1228	1159
			C. on 75th Percentile Hourly Wage			
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.0893	-0.4293*	-0.3637	-0.4751	1.2909**	0.0008
	(0.3367)	(0.2596)	(0.3032)	(0.4111)	(0.5698)	(0.3713)
Observations	1275	1275	1275	1167	1235	1171

Notes: ATT estimated via the Gardner (2022) two-stage difference-in-differences estimator. Sample is six CDL-related occupations from O*NET online, 2000–2024. Wages are in 2015 dollars, adjusted using the annual CPI. Standard errors clustered at the state level are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Together these results are in line with our CPS results. O*Net does not capture self-employed workers, so the insignificance in the O*Net results for employment matches that of the effects found for the probability of employment as a driver, overall and by subgroup, found in the CPS data. The wage variables capture different, albeit related, information across the two data sets. More specifically, the CPS outcomes are average wage and the probabilities of being below the 25th percentile wage or above the 75th percentile wage, while the O*Net wage variables are median hourly wages and the amount of the 25th and 75th percentile wages. The wage data support the overall picture of a tightening labor market found in the CPS data, but variation in the measures and the different occupational subgroups available prevents direct comparison of the outcomes across data sets, particularly for the wage data.

The regressions above rely on a two-stage difference-in-differences framework (Butts and Gardner, 2022). As a robustness check on these results, we also use Callaway & Sant'Anna's cohort-based estimation approach (aka the CSDID method, Callaway and Sant'Anna, 2021) to avoid the bias and inconsistency issues identified by Goodman-Bacon (2021). A limitation of the

CSDID method is that it does not allow for time-varying controls, which means that we are unable to properly control for the rich set of demographic characteristics in the CPS data. As such, we only use the CSDID method to re-estimate using the O*Net data. The results are reported in Appendix Table 1 and look generally similar to those for the main results – there are few employment effects, but wages increase, especially at the lower end of the wage distribution.

New Mexico Analyses

The CPS and O*Net data and our causal inference approach can only estimate average treatment effects at the state level. For New Mexico, with only one observation per year, we use graphical comparisons, *t*-tests for continuous variables and *chi*-squared tests for binary variables to compare outcomes before versus after the start of cannabis sales in New Mexico in 2022. Descriptive information on labor market outcomes in New Mexico is provided in Figures 6 and 7. The patterns are similar to those in the main sample in that heavy truck drivers and school bus drivers tend to command the highest wages throughout the sample period and increases in hourly wages are seen in the later years. In line with our hypotheses, we see evidence of increased wages post-AUC sales for driver/sales, bus drivers, and taxi/chauffeurs. However, hypothesized increases in wages are not evident for heavy or light trucking. In Figure 6, only drivers/sales workers show evidence of increased employment, suggesting the New Mexico AUC market primarily uses this class of drivers for transporting goods within the state, whether between wholesaler and retailer or for home delivery to end consumers.

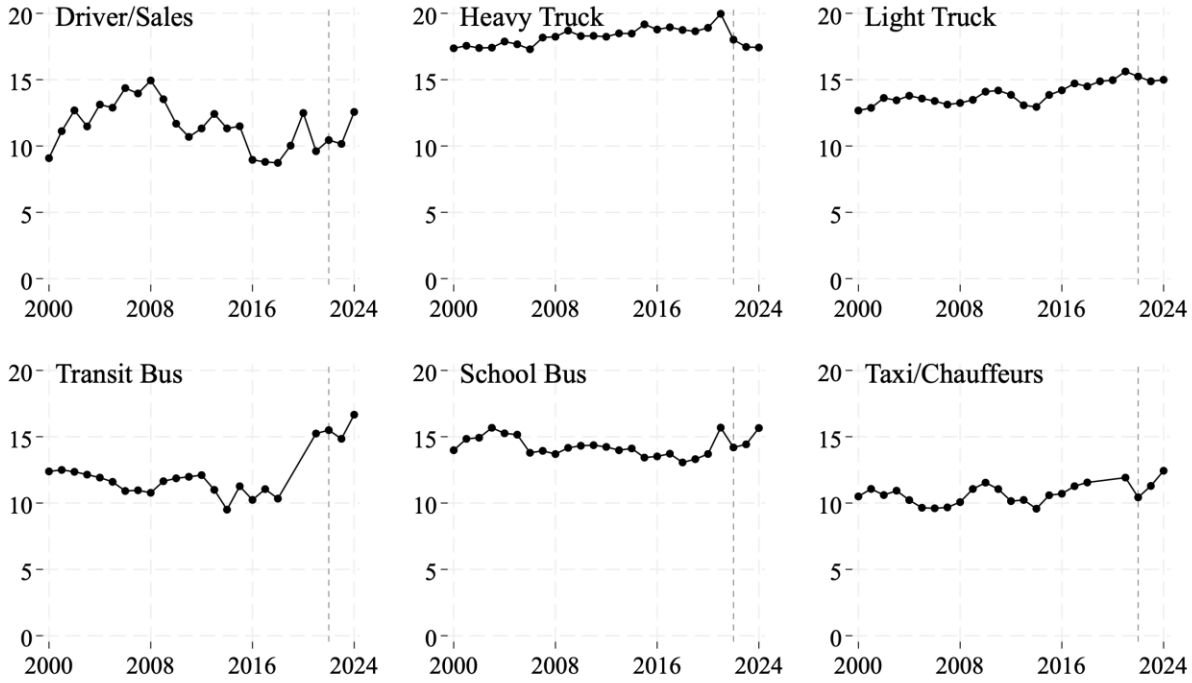


Figure 6. New Mexico Median Hourly Wage Trends by Occupation (O*NET), 2000–2024

Notes: Each panel plots New Mexico's median hourly wage (in 2015 dollars) for one of the six CDL related occupations for 2000-2024 sample period, using ONET occupation-state-year data. The dashed vertical line marks 2022, the first year of AUC sales in New Mexico. 2019 and 2020 data are not available for public transit Bus drivers and taxi drivers in our source data.

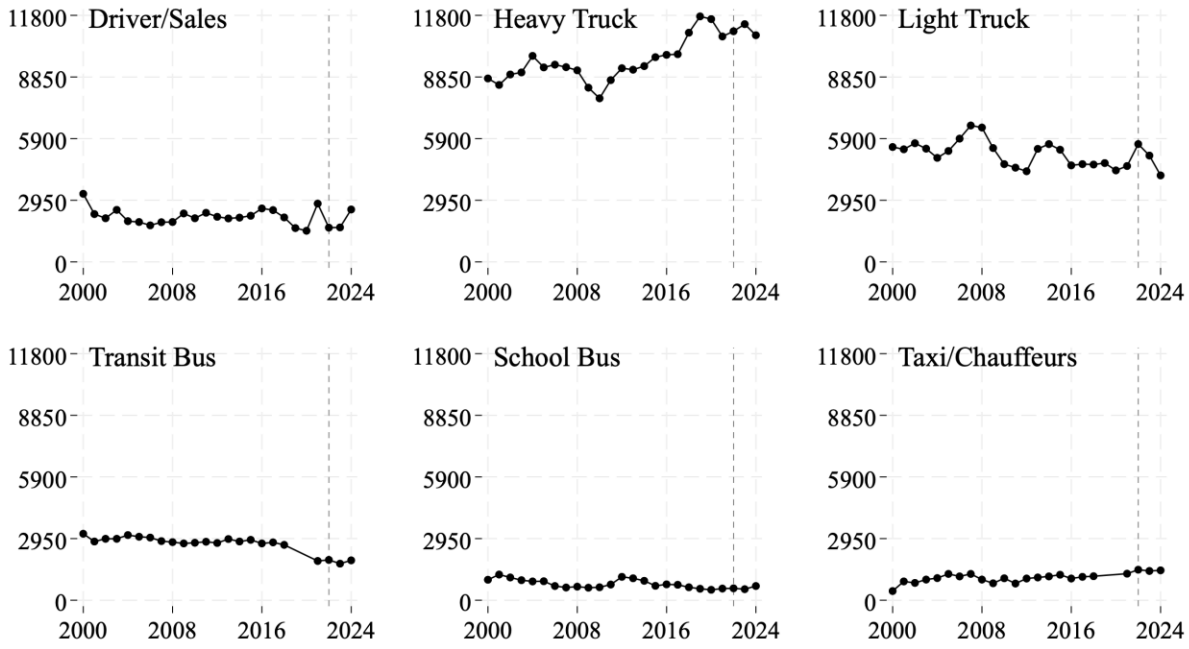


Figure 7. New Mexico Employment Trends by Occupation (O*NET), 2000–2024

Notes: Each panel plots New Mexico's total employment trends for one of the six CDL related occupations for 2000-2024 sample period, using O*NET occupation-state-year data. The dashed vertical line marks 2022, the first year of AUC legalization in New Mexico. 2019 and 2020 data are not available for public transit Bus drivers and taxi drivers in our source data.

The CPS comparisons presented in Table 8 show that the AUC access is associated with a one-percentage point decrease in the likelihood of being a driver from a pre-2022 mean of 3%. The likelihood of being a particular type of driver varied little pre- versus post-AUC access. The likelihood of working full-time increased by six percentage points. Although hourly wages have increased slightly from $17.06 to $17.62 per hour, the difference is not statistically significant. The wage distribution shifted asymmetrically. The share of drivers earning below the 25th percentile hourly wage dropped from 30% to 21% after 2022, the difference is about 9 percentage point decline and statistically significant. In other words, the lower tail of the wage distribution decreased meaningfully. The share of drivers above the 75th percentile hourly wage stayed relatively flat, hovering around 28–29% with no significant change. Put together, the wage distribution shifts in New Mexico post-AUC appears to have raised the wage floor for low-earning drivers. The decrease in driving employment with higher wages is consistent with a tightening labor market in line with full sample results.

Table 8: New Mexico Drivers, Pre- and Post-2022 Comparison (CPS)

Variable	NM Mean Pre-2022	NM Mean Post-2022	National Mean Pre-2022	Difference (Post − Pre)	Test Statistic
Any driver (=1)	0.03	0.02	0.03	−0.01***	$\chi^2 = 30.20$
Bus driver (=1)	0.12	0.13	0.13	0.01	$\chi^2 = 0.53$
Taxi driver (=1)	0.05	0.05	0.08	0.00	$\chi^2 = 0.02$
Truck driver (=1)	0.83	0.82	0.79	-0.01	$\chi^2 = 0.51$
Self-emp(=1)	0.11	0.12	0.11	0.01	$\chi^2 = 0.00$
Full-time (=1)	0.84	0.89	0.86	0.06***	$\chi^2 = 16.34$
Usual hours worked per week	42.27	42.44	42.20	0.17	t = -0.18
Pr (Below 25th Percentile Wage)	0.30	0.21	0.28	-0.09**	$\chi^2 = 4.58$
Avg. Hourly wage (in $2015)	$17.06	$17.62	$18.16	$0.56	t =-0.66
Pr (Above 75th Percentile Wage)	0.28	0.29	0.31	0.01	$\chi^2 = 0.032$

Notes: Differences are calculated as post-2022 minus pre-2022 New Mexico means using *chi*-squared tests for dichotomous variables and *t*-tests for continuous variables using Welch's t-statistic. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The comparisons across subsectors in the O*Net data suggest that the aggregated categories in the CPS may be masking variation that exists within those categories. Heavy truck drivers and taxi/chauffeurs experienced increased employment, while transit and school bus drivers experienced decreased employment relative to pre-2022. However, COVID-19 might explain these differences as online and delivery sales increased. The declines in employment among bus drivers are in line with our hypothesized effects from AUC access. As hypothesized, wage effects are positive among light truck and transit drivers, but heavy truck drivers experience a decline in wages at the median and 75th percentile. The O*Net data do not allow us to disentangle self-employment effects, which might explain the decrease in wages reported among heavy truck drivers in New Mexico.

Table 9. New Mexico Drivers, Pre- and Post-2022 Comparison (O*NET)

A. Log Employment

Occupation	NM Mean Pre-2022	NM Mean Post-2022	National Avg (Pre-2022)	Difference (Post - Pre)	t-statistic (Welch)
Driver/Sales	7.673	7.547	8.495	-0.126	0.86
Heavy Truck	9.158	9.314	9.914	0.155***	-6.01
Light Truck	8.548	8.501	9.267	-0.048	0.50
Transit Bus	7.938	7.530	8.680	-0.408***	10.48
School Bus	6.647	6.382	7.413	-0.265**	2.87
Taxi/Chauffeur	6.915	7.266	7.535	0.351***	-6.38
Any Driver	7.825	7.756	8.577	-0.069	0.29

B. Hourly Wage, 25th Percentile (2015$)

Occupation	NM Mean Pre-2022	NM Mean Post-2022	National Avg (Pre-2022)	Difference (Post - Pre)	t-statistic (Welch)
Driver/Sales	9.080	9.421	9.373	0.341	-1.50
Heavy Truck	14.943	15.887	16.261	0.944	-2.44
Light Truck	10.588	12.081	11.243	1.492***	-4.79
Transit Bus	8.985	12.853	11.607	3.867***	-7.83
School Bus	11.998	12.760	13.123	0.762	-1.93
Taxi/Chauffeur	9.082	10.171	9.553	1.089*	-2.91
Any Driver	10.834	12.195	11.895	1.361**	-2.44

C. Hourly Wage, Median (2015$)

Occupation	NM Mean Pre-2022	NM Mean Post-2022	National Avg (Pre-2022)	Difference (Post - Pre)	t-statistic (Welch)
Driver/Sales	11.578	11.058	12.133	-0.520	0.61
Heavy Truck	18.302	17.637	19.890	-0.666**	2.78
Light Truck	13.822	15.035	14.682	1.213***	-6.24
Transit Bus	11.590	15.668	14.151	4.078***	-6.88
School Bus	14.222	14.759	16.622	0.538	-1.12
Taxi/Chauffeur	10.599	11.385	11.269	0.786	-1.31
Any Driver	13.423	14.257	14.849	0.834	-1.30

D. Hourly Wage, 75th Percentile (2015$)

Occupation	NM Mean Pre-2022	NM Mean Post-2022	National Avg (Pre-2022)	Difference (Post - Pre)	t-statistic (Welch)
Driver/Sales	16.716	16.134	17.658	-0.582	0.76
Heavy Truck	22.887	20.634	24.562	-2.253***	7.36
Light Truck	18.176	18.323	19.642	0.147	-0.22
Transit Bus	14.105	18.051	16.952	3.946**	-7.28
School Bus	16.909	15.312	20.861	-1.597*	2.32
Taxi/Chauffeur	12.715	13.237	13.743	0.522	-1.01
Any Driver	17.028	16.948	19.009	-0.079	0.12

Notes: Welch t-tests compare New Mexico's O*NET occupation-state-year observations before and after 2022, the state's first year of recreational dispensary sales. The pre-period covers 2000-2021 and the post-period covers 2022-2024. National Avg (Pre-2022) reports the average across all sample states for the same occupation prior to 2022. Log Employment is ln(tot_emp + 1), and wages are hourly wages adjusted to 2015 dollars using the CPI. Each occupation-year cell is a single ONET estimate rather than a sample of individuals, so the post-2022 period contains at most three observations per occupation.

With the exception of the heavy trucking results, the comparisons in Tables 8 and 9 suggest NM also experienced tighter labor markets for drivers with AUC access. The New Mexico results, however, may be confounded by COVID-related effects overlapping AUC legalization and the start of dispensary sales (Stith and Paudel, 2024).

DISCUSSION

This study shows that access to AUC sales significantly affects labor market for commercial driving. Our findings are consistent with increased demand for transportation services, especially among sectors defined as drivers/sales workers and truck drivers and taxi/chauffeur services. These effects are reflected in increased full-time employment, increased hours worked, increased self-employment, and higher wages, especially at the lower end of the wage distribution. For bus drivers, some evidence of a role for supply-side factors exists with a transient decline in the probability of being employed as a bus driver in the first few years post-AUC legalization in the CPS data and increasing wages for school bus drivers throughout the wage distribution in the O*Net data.

These results imply that the primary net effect from AUC dispensary access on the labor market for commercial drivers is an increase in demand for commercial drivers. This result matches the literature, which found increased labor demand outweighed supply-side effects (Chakraborty et al., 2021; Dave et al., 2025). Unlike the prior literature, which found primarily reductions in unemployment without increased wages, we find that wages respond more than employment, likely because commercial driving was a tighter labor market prior to AUC dispensary access than agriculture, services, and manufacturing, the sectors primarily affected in other studies. Absent wage effects, concerns about spillovers to other industries are limited, and reduced unemployment is unambiguously positive. However, in the presence of wage effects with reductions in unemployment, it is likely that the now tighter labor market for commercial drivers is increasing wages in sectors that compete with commercial driving for labor and increasing prices throughout the economy if higher wages are passed through to consumers in the form of higher prices on transportation services and end goods. Clearly, commercial drivers benefit from a tighter labor market as they can demand higher wages, but those who hire commercial drivers now pay more.

This study has several limitations. Commercial driving is a highly heterogeneous occupation and our aggregated categories, especially in the CPS, likely mask underlying differential shifts within subsectors. For example, limited effects for bus drivers in the CPS might arise in part because we are combining public transit and school bus drivers in the O*Net data, which have different baseline wage levels and show differential responses to AUC access across the two sectors. Similarly, our treatment variable, the start of AUC sales through dispensaries, masks significant heterogeneity across states in how dispensary markets evolved due to differences in regulation, such as the legality of home cultivation, the cost of upfront licensing fees, implementation of taxes (both state and local), and the extent to which local jurisdictions opt out of cannabis sales. The CPS data are designed to provide statistically representative samples at the state level, but the O*Net data are only designed to be nationally representative. In addition, the O*Net data do not capture self-employed workers. As such, our analysis using the wage distribution data should be interpreted with caution. Lastly, our estimates represent only the net effects from both demand and supply-side factors, such that while demand-side effects dominate for most commercial driving sectors, supply-side factors may also be working in the opposite direction for employment or reinforcing the upward pressure on wages.

Future extensions of this research will analyze medical and AUC legalization events and medical dispensary entry, more fully assess longer term trends in the event studies, adjust self-employed earnings based on 50 weeks rather than 52 weeks, explore additional subcategories in the O*Net data, and assess the relevance of unionization and how this varies across sectors. We also plan to further explore the taxi driver category, as our sample period coincides with the rise of the rideshare industry, which led to important structural changes in labor market conditions for commercial drivers.

Inadequate drug testing technology (Marshall, 2023) does not appear to be a major factor driving our results. Employment has not declined due to drivers testing positive for THC. Similarly, with the possible exception of bus drivers, employment shows no declines from individuals opting out of commercial driving in order to consume cannabis. The increase in self-employment possibly could relate to transportation companies offloading drug-related risks to self-employed drivers or reflect reduced frequency of drug testing among self-employed drivers; however, major changes in the labor market for commercial drivers in response to the introduction of improved drug testing technologies seem unlikely.

Policymakers considering expanding cannabis access should be aware that upward pressure on wages in the already tight labor market for commercial drivers may occur, potentially driving up prices for transportation services and eventually end goods. However, the magnitude of the effects documented herein is likely outweighed fiscally by the tax revenues and employment increases (absent wage increases) found in sectors outside of commercial driving that result from the opening of newly legal AUC markets. Without any statistically significant differences in average wages pre- and post-dispensary access in NM, cannabis legalization effects on the transportation sector are likely small and not a significant factor in commercial driver shortages, particularly in the public sector, as described by the NM DOT and documented here. Instead, regulatory constraints on wages should be lifted so that the public sector can compete fairly with the private sector in attracting drivers when labor markets are tight, regardless of the cause.

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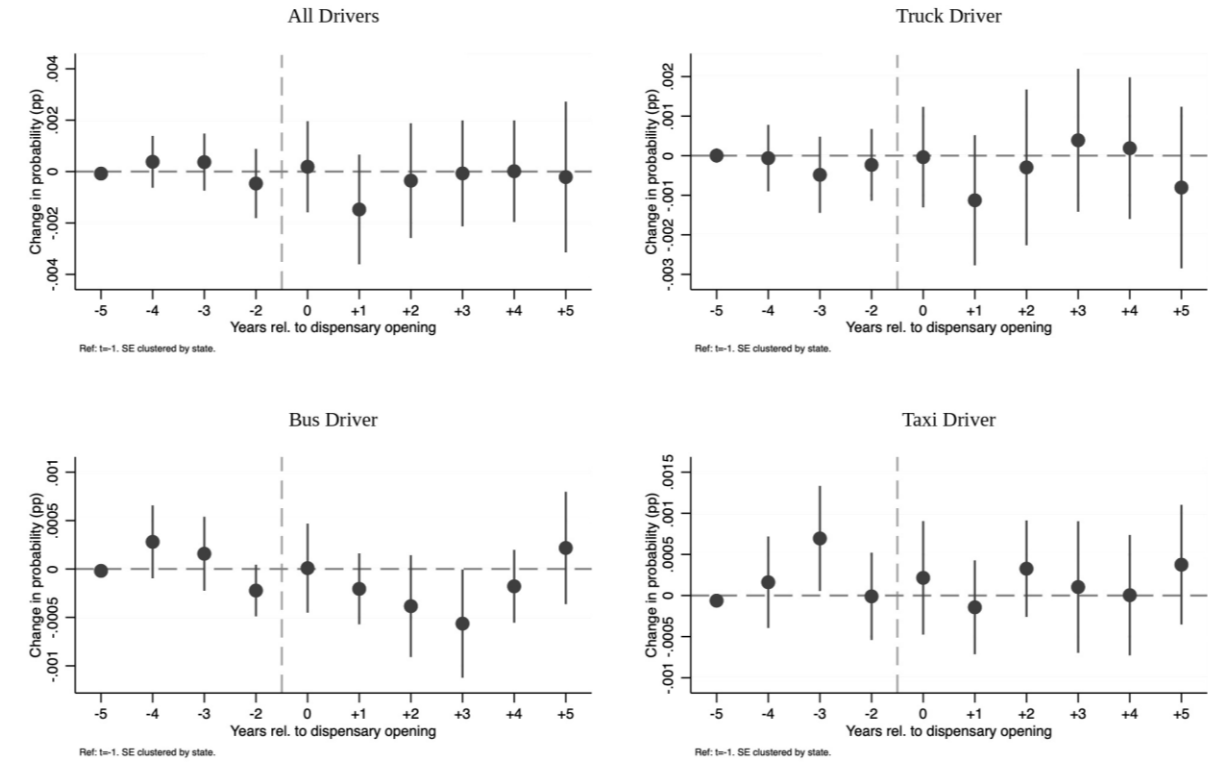
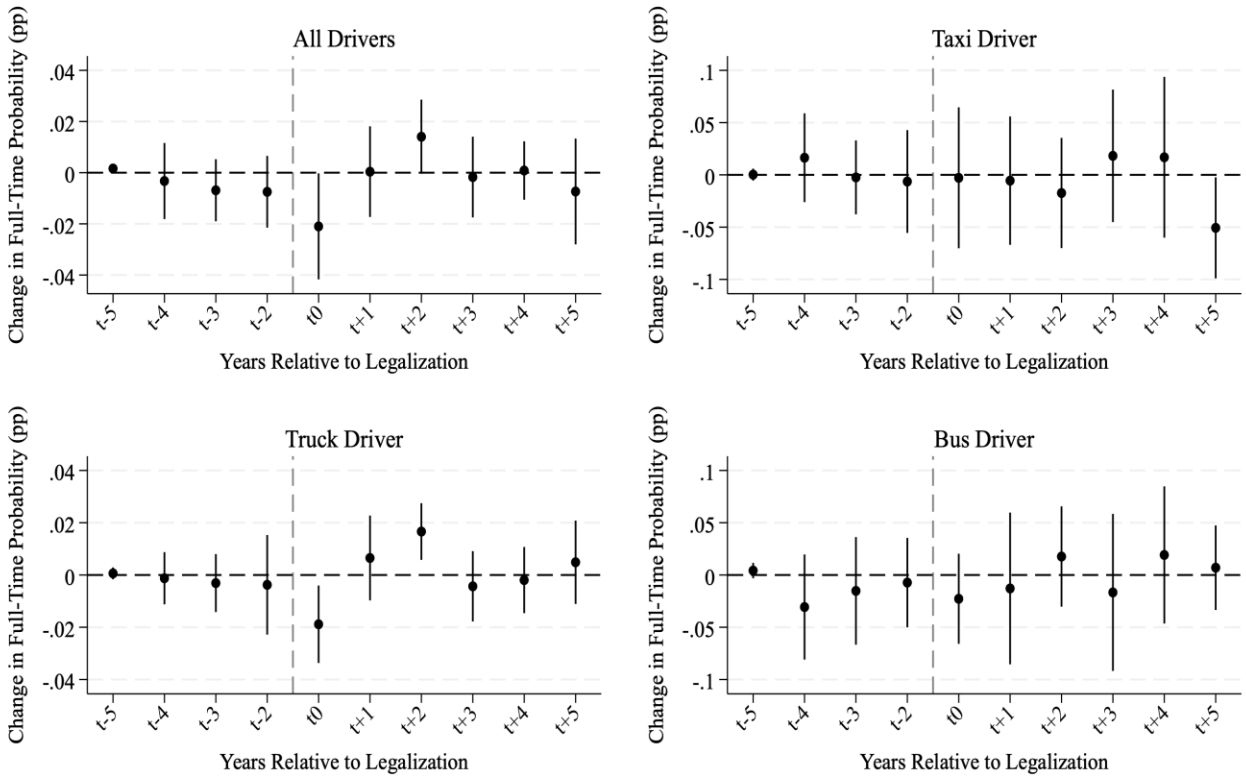
APPENDIX FIGURES & TABLE



Appendix Figure 1: Effect of AUC on the Likelihood of Being in Driving Occupations for All Drivers, Truck, Bus, Taxi (CPS)

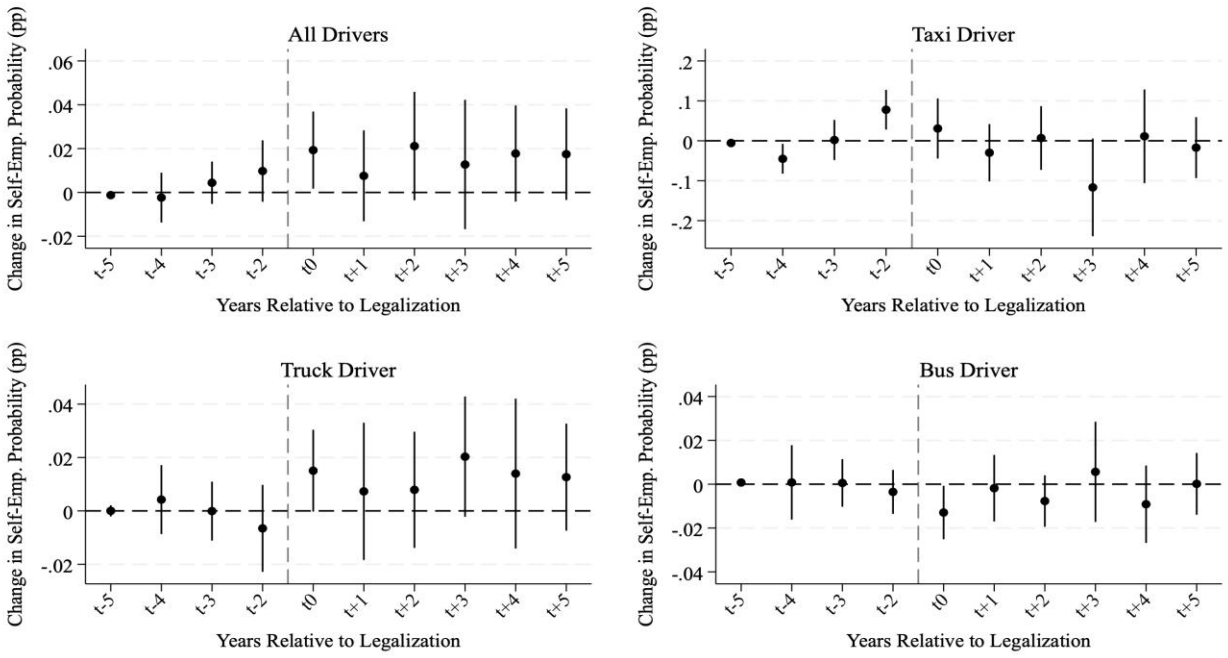
Notes: Figure 4 shows the likelihood of being in any group of commercial drivers, a truck driver, a bus driver, or a taxi driver. The sample consists of CPS basic respondents ages 18–64 who are currently employed (at work or with a job but absent that week) from 2000–2024. Non-employed individuals are excluded.



Base: t=-1. SE clustered by state. Dashed line marks treatment.

Appendix Figure 2: Effect of AUC on the Likelihood of Working Full-Time by Occupation

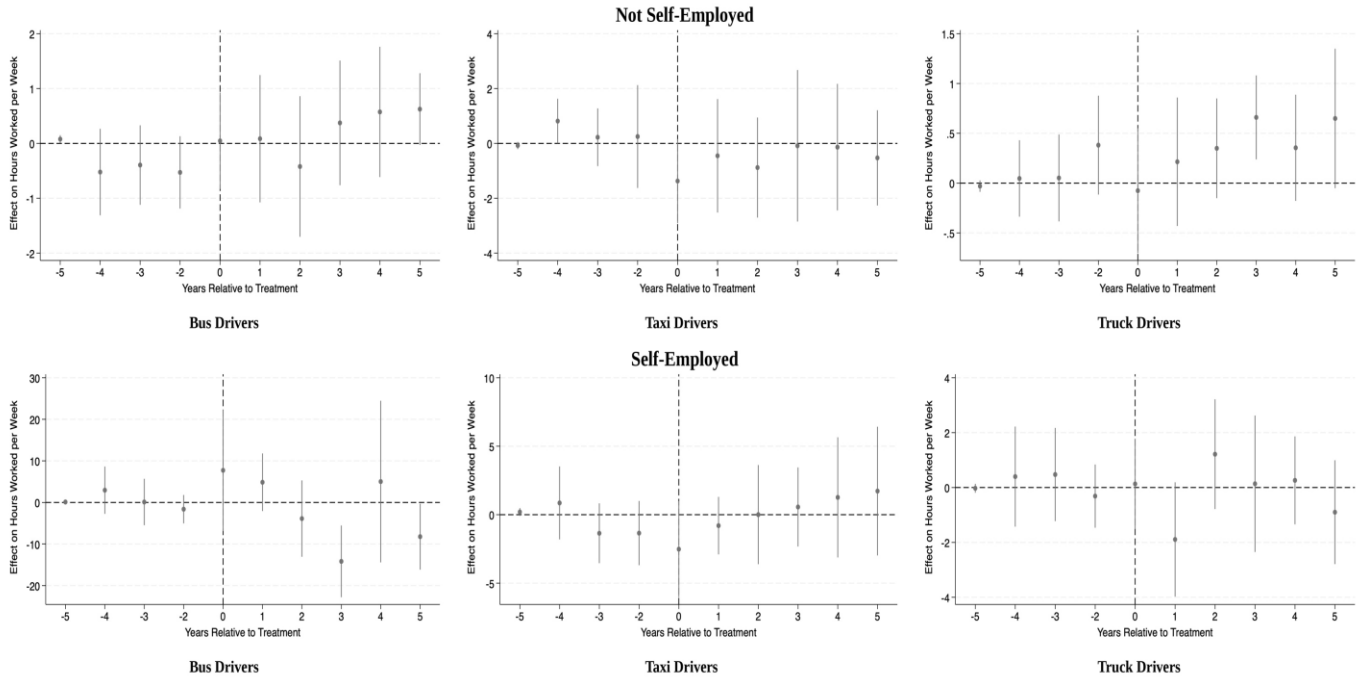
Notes: Event study specification estimates using period t = -1. Outcome equals one if usual hours worked are 35 or more per week. Standard errors clustered by state. Dashed line marks the year of legalization.



Base: t=-1. SE clustered by state. Dashed line marks treatment.

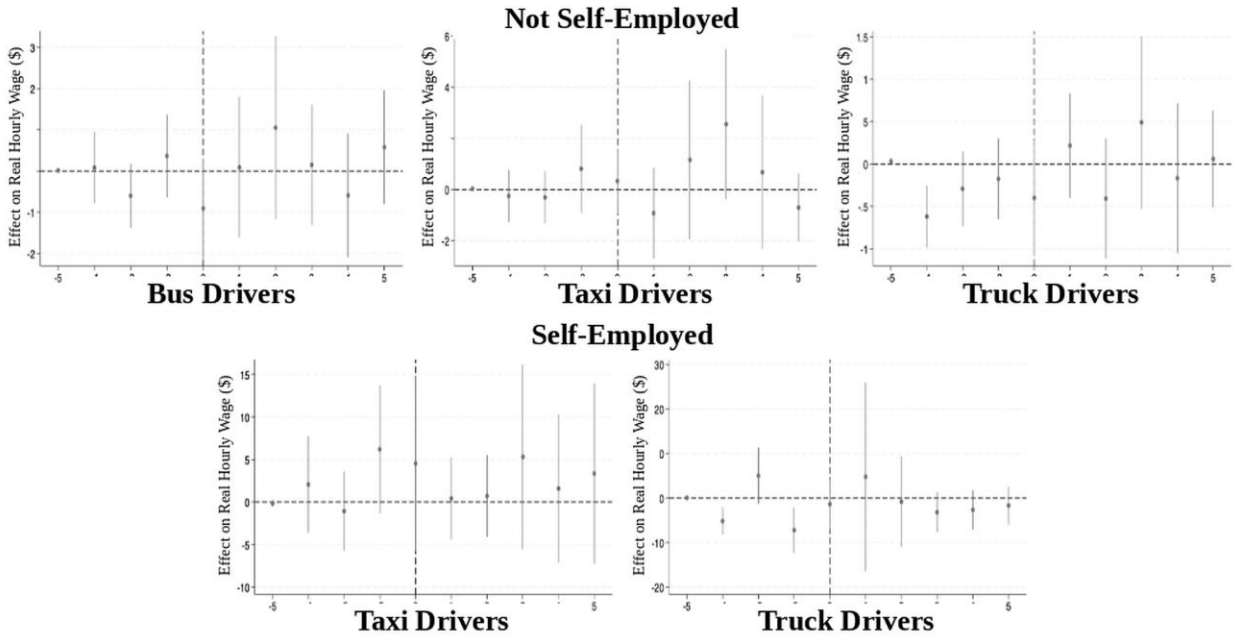
Appendix Figure 3: Effect of AUC on the Likelihood of Being a Self-Employed employee by Occupation.

Notes: Event study specification estimates from separate did2s regressions by occupation, reference period t = -1. Outcome equals one if the individual is self-employed. Standard errors clustered by state. Dashed line marks the year of legalization.



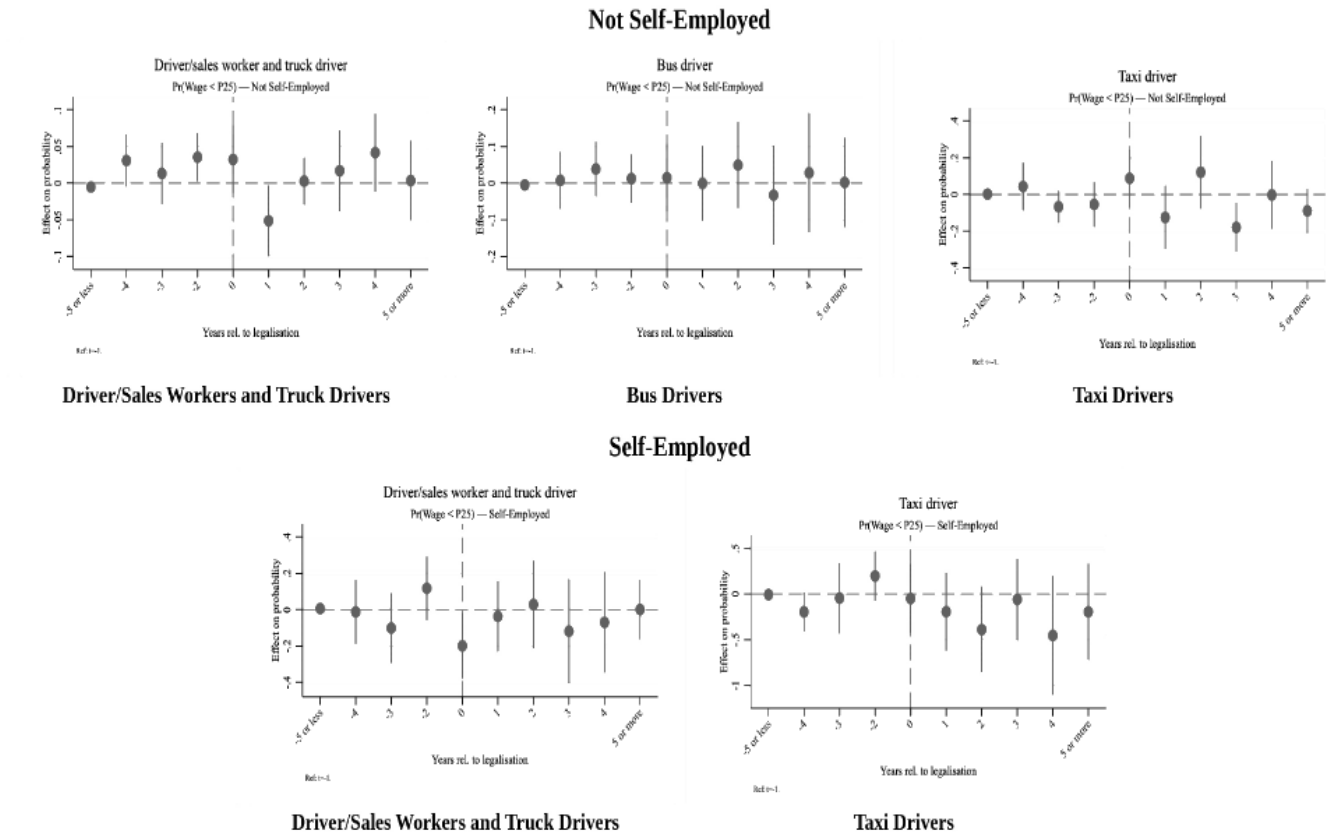
Appendix Figure 4: Effect of AUC on the Usual Hours Worked by Self-employed Status

Notes: Event study specifications using reference period t = -1. Outcome is usual hours worked per week by self-employment status. Standard errors clustered by state. Dashed vertical line marks the treatment year.



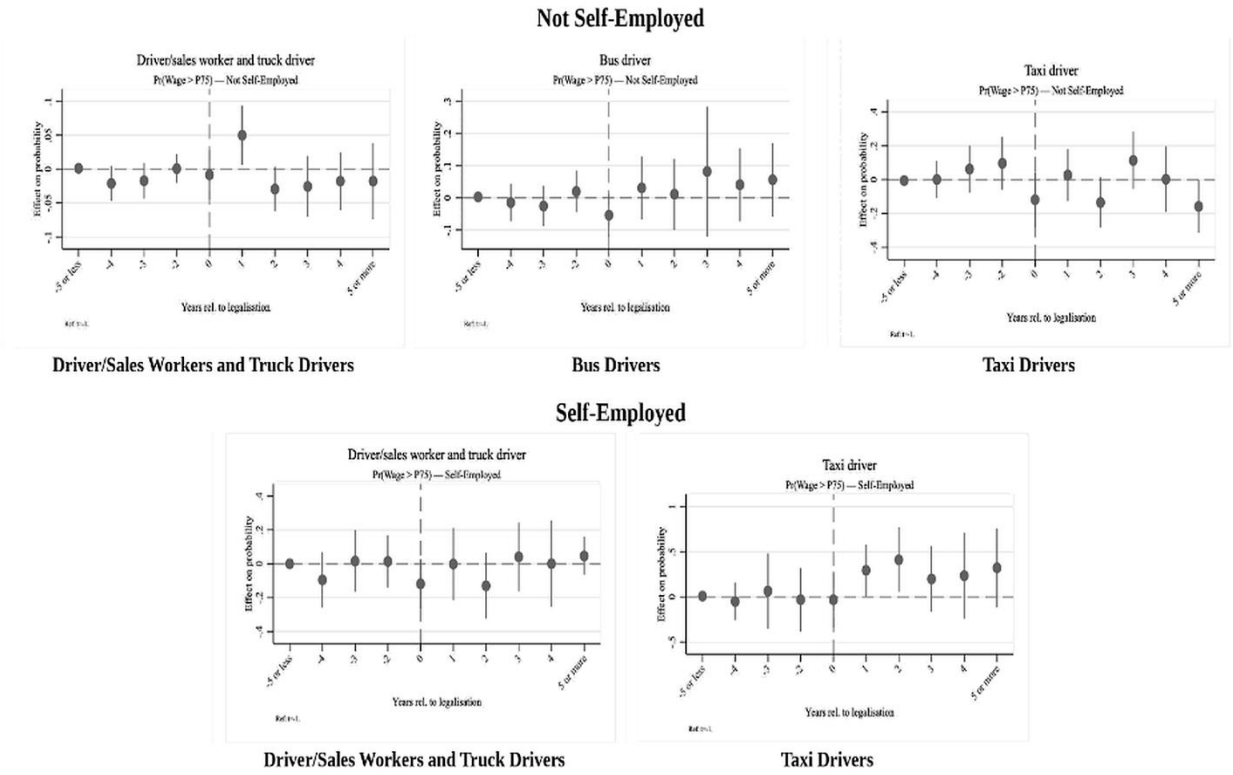
Appendix Figure 5: Effect of AUC on Average Hourly Wage by Self-employed Status

Notes: Event study estimates from separate did2s regressions by occupation and self-employment status. Outcome is real hourly wage (2015 dollars). Reference period is one year prior to treatment. Dashed vertical line marks year of treatment. Self-employed bus driver group is omitted because of small sample size.



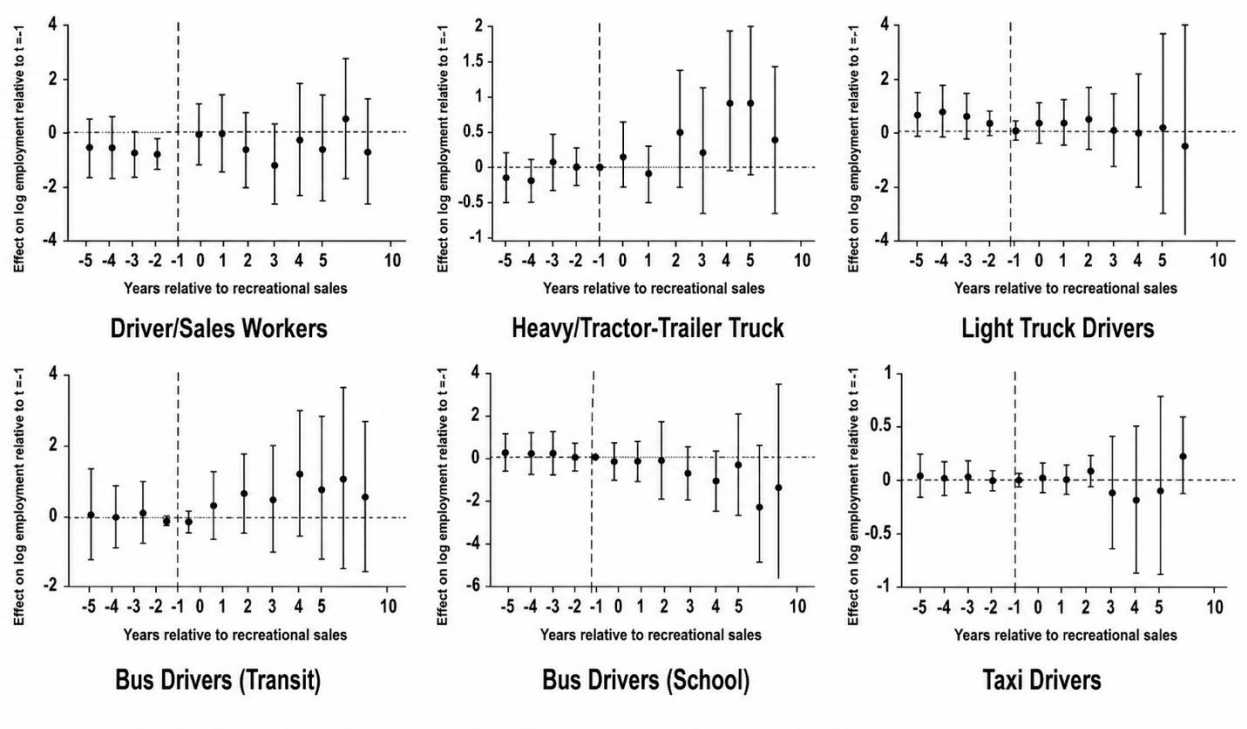
Appendix Figure 6: Effects of AUC on the Likelihood of Being Below 25th Percentile by Self-employed Status (CPS)

Notes: Event study specification using reference period t = -1. Outcome equals one if CPS hourly wage falls below the O*NET 25th percentile wage. Self-employed bus drivers are omitted because of small group of observations. Standard errors clustered by state.



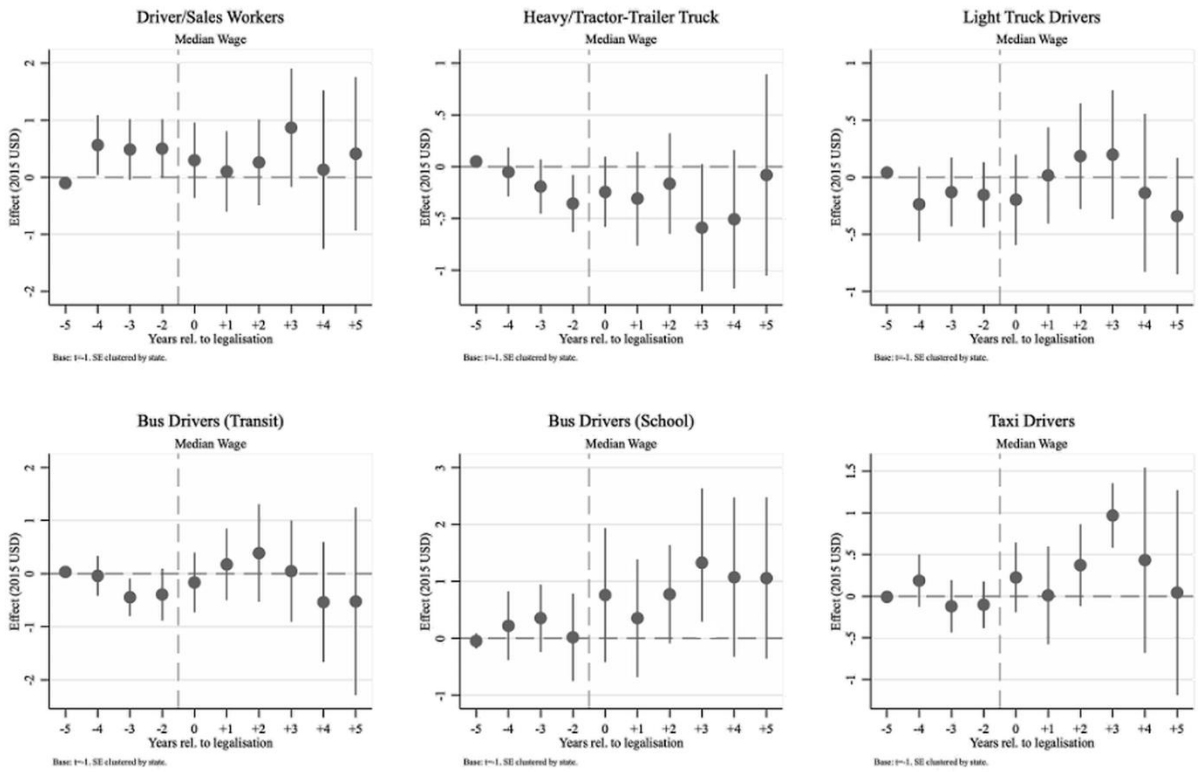
Appendix Figure 7: Effects of AUC on the Likelihood of being Above 75th Percentile by Self-employed Status (CPS)

Notes: Event study specification using reference period t = -1. Outcome equals one if CPS hourly wage falls above the O*NET 75th percentile wage. Self-employed bus drivers are omitted because of small group of observations Standard errors clustered by state.



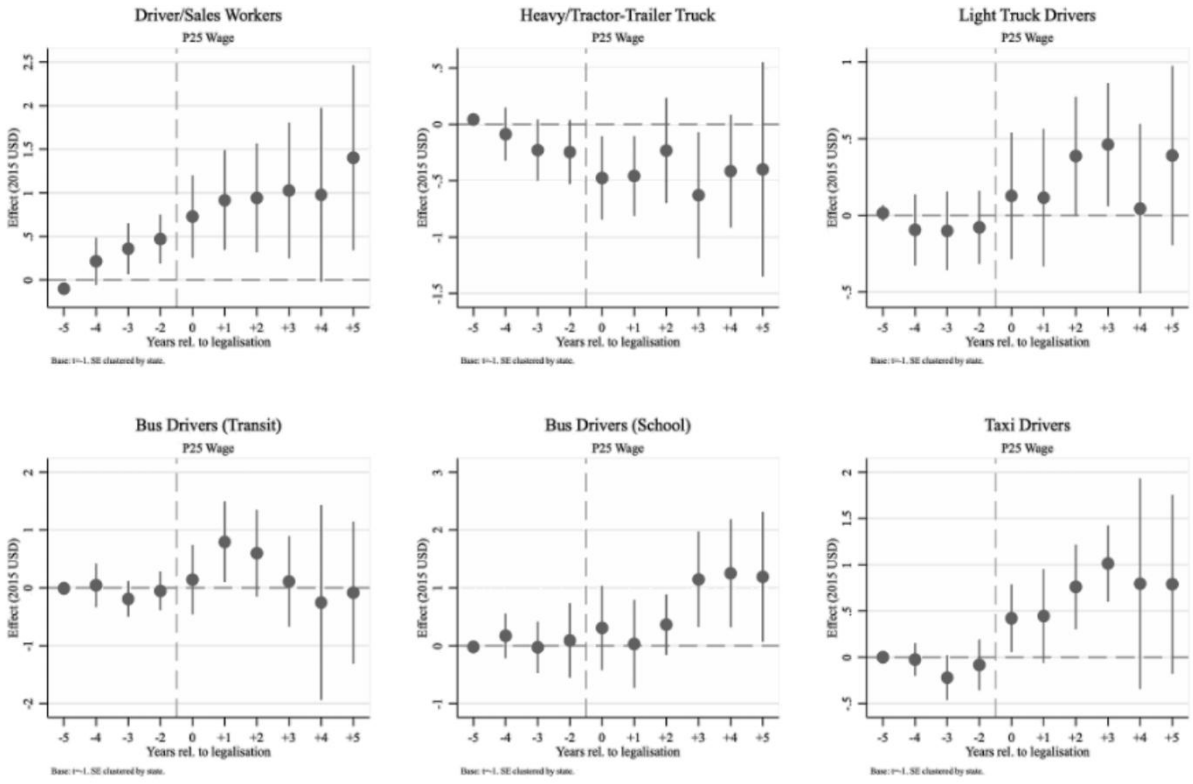
Appendix Figure 8: Effect of AUC on the O*NET Log Employment

Notes: Event study Specification estimates from separate did2s regressions by occupation, reference period t = -1. Outcome is log total employment, O*NET state-year panel. Standard errors clustered by state. Dashed line marks the year of legalization.



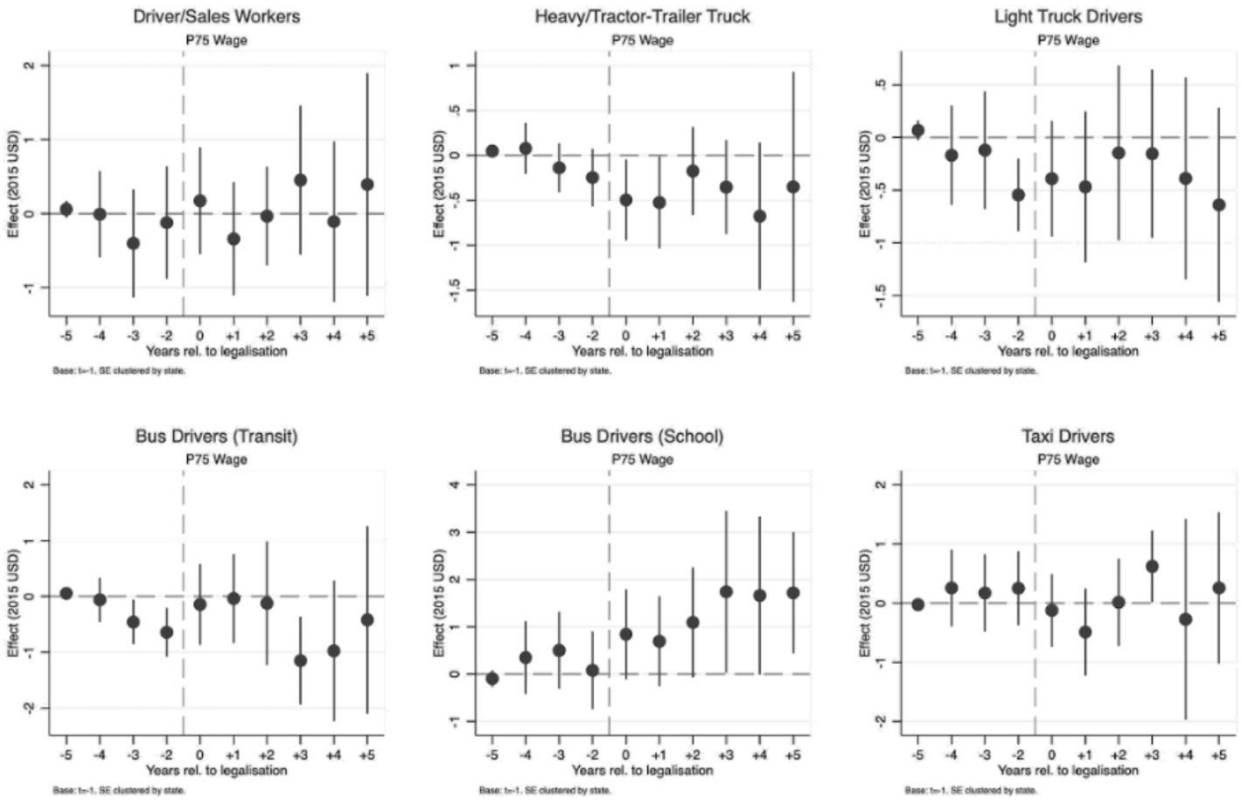
Appendix Figure 9: Effect of AUC on the O*NET Median Hourly Wage

Notes: Event study specification estimates using reference period t = -1. Outcome is O*NET median hourly wage in 2015 dollars. Standard errors clustered by state.



Appendix Figure 10: Effects of AUC on O*NET 25th Percentile Hourly Wage

Notes: Event study specification estimates using reference period t = -1. Outcome is O*NET 25th percentile hourly wage in 2015 dollars and separate by. Standard errors clustered by state.



Appendix Figure 11: Effects of AUC on O*NET 75th Hourly Wage

Notes: Event study specification estimates using reference period t = -1. Outcome is O*NET 75th percentile hourly wage in 2015 dollars. Standard errors clustered by state.

Appendix Table 1: Effects of Recreational Dispensary Sales on O*NET Employment and Hourly Wage Using CSDID

	(1) Driver/Sales Workers	**(2)** Heavy and Tractor-Trailer Truck Drivers	**(3)** Light Truck Drivers	**(4)** Bus Drivers, Public Transit	**(5)** Bus Drivers, School	**(6)** Taxi Drivers and Chauffeurs
			A. on Log Employment			
ATT	-0.028	0.048**	-0.019	0.012	-0.015	-0.024
	(0.050)	(0.022)	(0.038)	(0.050)	(0.058)	(0.102)
Observations	1262	1274	1273	1142	1203	1156
			B. on 25th Percentile Hourly Wage			
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.874***	-0.040	0.307	0.159	0.738*	0.508**
	(0.264)	(0.241)	(0.202)	(0.345)	(0.389)	(0.216)
Observations	1274	1275	1275	1154	1228	1159
			C. on Median Hourly Wage			
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.305	0.062	-0.001	-0.072	0.884**	0.045
	(0.378)	(0.291)	(0.173)	(0.426)	(0.379)	(0.263)
Observations	1274	1275	1275	1154	1228	1159
			D. on 75th Percentile Hourly Wage			
	(1)	(2)	(3)	(4)	(5)	(6)
ATT	0.374	-0.186	-0.500*	-0.325	0.717*	-0.071
	(0.333)	(0.337)	(0.261)	(0.450)	(0.424)	(0.400)
Observations	1274	1275	1275	1154	1228	1159

Notes: ATT estimated via the Callaway and Sant'Anna (2021) csdid estimator using O*NET occupation-state-year panel data, 2000-2024, with standard errors clustered at the state level reported in parentheses. Panel A reports effects on log employment. Panels B to D report effects on hourly wages (in 2015 dollars) at the 25th percentile, median, and 75th percentile, respectively. Sample includes six commercial driver license related occupations. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$