Title: Estimating the effect of recreational marijuana legalization on labor market outcomes, labor supply and leisure preferences

Abstract: This article investigates the effect of Recreational Marijuana Laws (RMLs) on time use trends and labor market outcomes. I use a difference-in-differences research design, exploiting variation in the timing of legalization, to estimate the effect of RMLs on labor supply, leisure demand, and time use distribution.

Motivation:

In the past twenty years, public sentiment regarding marijuana legalization has shifted significantly[[1]](#footnote-1). In 2012, Colorado and Washington legalized the recreational use of marijuana, and since then 16 additional states as well as the District of Columbia have implemented similar policies. While there are a number of studies focused on the effect of medical marijuana legalization (MML) on labor market outcomes, far fewer have investigated the effect of recreational legalization. The lack of empirical research on the effect of RMLs is particularly concerning since only about 2% of the population in MML states are eligible for medical marijuana, thus existing studies of MMLs may not adequately reflect the effect of RMLs on otherwise similar populations[[2]](#footnote-2).

Thus far, studies examining the effect of RMLs on labor market outcomes have been relatively limited in scope, finding minimal or insignificant effects on labor market participation and wages (Maclean et al., 2020). No studies exist to date examining the effect of RMLs on time-use trends, nor analyzed whether these effects vary based on individual characteristics.

RQ:

Does the implementation of state-level RMLs affect labor market outcomes or time-use trends? Do these effects vary based on individual characteristics such as age or gender?

Literature Review:

Research on the effect of RMLs remains relatively limited due to their relatively recent adoption. Cerdá et al. (2020) use data from the National Survey on Drug Use and Health to show that the adoption of RMLs contributed to an increase in marijuana use among adolescents and adults 26 years old or older. Similarly, Miller et al. (2017) show that the implementation of RML in Washington significantly increased marijuana use amongst undergraduates, and moreover found that the effect was heterogenous across gender and ethnicity. Yet, it remains unclear to what extent this translates into time-use and labor market outcomes.

Since few studies examine the impact of RMLs on labor-market outcomes and time-use trends, research focused on MMLs form the foundation for much of the on-going research regarding the effect of RML adoption. Sabia and Nguyen (2018) find that the effects of MMLs employment and hours worked are minimal, arguing that the effect of marijuana legalization is theoretically ambiguous. It may be negatively related to labor supply due to marijuana’s association with amotivation and diminished cognition (Volkow et al., 2016; van Ours and Williams 2011), amongst other negative effects noted in the literature. On the other hand, legalization may have positive effects on labor market outcomes. For instance, Nicholas and Maclean (2018) find that the adoption of an MML increases the probability of 50+ year old adults working full-time. While Ullman (2017) finds that the legalization of medical marijuana decreases the likelihood of respondents being absent from work. Alternatively, there may be no significant relationship at all.

Of particular relevance here are two recent articles examining the effect of MMLs using the American Time-Use Survey. Chu and Gershenson (2018) find that the adoption of MMLs have no effect on secondary students but leads to an approximate 20% increase in leisure-activity time and 20% decrease in education-activity time, amongst post-secondary students. Focusing specifically on labor market outcomes, Jergins (2022) finds that MMLs largely do not affect labor market outcomes, though they do appear to decrease job search time amongst young men and increases the likelihood of labor force participation amongst women aged 30 to 39.

Research Design:

Data:

The primary data source is the American Time Use Survey (ATUS) from 2003 to 2019. The ATUS collects information on how Americans allocate their time to a variety of potential activities. Specifically, it asks individuals to sequentially report their activity from 4 a.m. on the day before the interview to 4 a.m. on the day of the interview.

The ATUS is based on a subset of respondents to the Current Population Survey, which are then assigned a nationally representative weight. Since the ATUS is based on CPS respondents, we can collect a range of demographic variables for each respondent, which will be used to analyze sub-group trends.

The dependent variables of interest are time spent on labor, and leisure,

Methodology:

I will use a two-way fixed-effect framework, based on a difference-in-difference identification strategy. Following a similar methodology as Jergins (2022), I will estimate the following model specification:

Individuals are indexed by subscript *i,* states are indexed by subscript *s*, and *t* denotes the year/month that the survey was administered. represents the outcome of interest, namely time spent on an activity of interest or labor market status. is a binary variable equal to one if the state *s* had legalized recreational marijuana use at time *t*. is a vector of individual and state characteristics such as gender, age, ethnicity, marital status, children, education, etc. is a set of time fixed-effects which will account for omitted variables that are time-varying secular changes that have a consistent effect across all states, while is a state fixed-effect which will control for time-invariant state-level covariates that are not otherwise controlled for in the model.

The identifying assumption of the model is that after controlling for time and state fixed effects, the time-use trends between the treated states (those who have adopted RMLs) and control states (those who have not adopted RMLs) are parallel. The set of controls will be limited to states which did not adopt RMLs during the study period to preclude comparisons between groups that were both already treated, which can lead to biased estimators when treatment effects are heterogenous (Roth et al., 2022).

Outline:

April 4-11 – Get feedback and make edits to methodology, collect and clean ATUS data, combine CPS respondent data with ATUS activity data, consider alternative model specifications

April 12-19 – Produce summary statistics tables, estimate final models

April 20-27 – Write-up of results, edit paper

References

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1. https://www.pewresearch.org/fact-tank/2019/11/14/americans-support-marijuana-legalization/ [↑](#footnote-ref-1)
2. https://www.nber.org/system/files/working\_papers/w28471/w28471.pdf [↑](#footnote-ref-2)