High Returns: The Effects of Legalizing Recreational Marijuana on Local Economic Activity and Household Finance

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February 2025

Abstract

We examine the impact of recreational marijuana legalization and distribution on local economic activity, household finance, and personal creditworthiness across eight U.S. states from 2001 to 2019. Utilizing a staggered difference-in-difference model at the county level, we observe significant improvements in local economies and household finances following the opening of marijuana dispensaries. These improvements are reflected in increased population growth, GDP, personal income, and housing prices. Additionally, personal creditworthiness also improves, as evidenced by a reduction in derogatory accounts and a rise in credit scores. Importantly, the benefits of legalization are more pronounced in underprivileged counties, underscoring a potential social equity dimension in the economic gains arising from recreational marijuana legalization. Our findings offer valuable insights to the ongoing debate over the economic implications of marijuana legalization, particularly concerning its role in promoting financial stability and reducing economic disparities.

Keywords: marijuana, household finance, economic activity, economic growth, legalization
JEL Classification Codes: G20, G50, H70, I18, I30, J10, K23

We are grateful for the helpful suggestions and comments from Yael Hochberg, Thomas Wollmann, Margarita Tsoutsoura, Nishant Vats, and seminar participants at Olin Business School. We are thankful to the RAND Corporation's Opioid Tools and Information Center Resources (RANDOPTIC) for providing the cannabis policy dates dataset. We are thankful to Olin Business School and Kellogg School of Management for financial support. Any errors are our own.

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We examine the impact of recreational marijuana legalization and distribution on local economic activity, household finance, and personal creditworthiness across eight U.S. states from 2001 to 2019. Utilizing a staggered difference-in-difference design at the county level, we observe significant improvements in local economies and household finances following the opening of marijuana dispensaries. These improvements are reflected in increased population growth, GDP, personal income, and housing prices. Additionally, personal creditworthiness also improves, as evidenced by a reduction in derogatory accounts and a rise in credit scores. Importantly, the benefits of legalization are more pronounced in underprivileged counties, underscoring a potential social equity dimension in the economic gains arising from recreational marijuana legalization. Our findings offer valuable insights to the ongoing debate over the economic implications of marijuana legalization, particularly concerning its role in promoting financial stability and reducing economic disparities.

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1. Introduction

We examine the economic and financial impacts of the legalization and distribution of recreational marijuana, providing novel evidence on local economic growth, household financial stability, and individual creditworthiness. The recent wave of state-level legalization of both medical and recreational marijuana has ignited intense debates about its effects on individual development (e.g., cognitive development, health) as well as broader societal implications (e.g., public safety). Despite extensive research into the various societal impact of marijuana, its influence on the local economy, household finance, and personal creditworthiness is unsettled. Leveraging the staggered legalization and distribution of recreational marijuana at the county level, we provide evidence that legalizing marijuana for recreational use leads to improvements in local population, GDP, personal income, and housing prices as well as enhancements in personal credit worthiness, as indicated by a reduction in derogatory accounts and increases in credit scores. Moreover, these benefits are not evenly distributed, they tend to be concentrated in counties with low educational attainment and higher minority populations. These results highlight important societal implications for policymakers considering the legalization of marijuana on underserved communities.

The landscape of marijuana use in the United States has been transformed dramatically over recent decades. Lifetime marijuana usage rose from 4% in 1969 to over 50% by 2023, while current marijuana use increased from 7% in 2013 to 17% in 2023, with particularly notable growth among young adults (McCarthy, 2023). The National Institute on Drug Abuse reports that marijuana consumption among young adults (ages 18–25) climbed from 29% in 2011 to 43% in 2021, and daily cannabis users now surpass daily alcohol users (Caulkins, 2024; LaMotte, 2024). These shifts reflect a growing normalization of marijuana use in the United States, paralleling the widespread legislative changes. Since California's legalization of medical marijuana in 1996,

approximately 80% of states have legalized medical marijuana, and as of 2024, nearly half permit recreational marijuana use.

These legislative developments have sparked intense debate over marijuana's societal and economic consequences. Medical research often emphasizes the potential negative health effects, including impaired cognitive development and elevated health risks.[1] However, the broader economic and social implications of legalization are more nuanced. Becker and Murphy (2013) argue that drug decriminalization reduces criminal activity, improving local economic conditions. Supporting this, Dragone et al. (2019) find evidence of decreased violent crime following marijuana legalization, possibly due to marijuana's sedative effects compared to other substances. Conversely, other studies highlight potential negative outcomes, such as increased drug-related fatalities and substance use disorders (Cheng, DeFranco, and Lin, 2023; Brown, Cohen, and Felix, 2023).

Amid these ongoing debates, our study evaluates the local economic impacts of recreational marijuana legalization, specifically examining local economic activity, household finances, and personal creditworthiness. From an economic perspective, legalization expands marijuana supply, potentially reducing prices and increasing consumer and producer surplus. Moreover, the establishment of the marijuana industry has the potential to generate direct employment opportunities and substantial tax revenues; for example, recreational marijuana sales

[1] Prior research finds heavy marijuana use decreases one's IQ (Fried, Watkinson, James, and Gray; 2002), hinders academic achievement in grade school and college (e.g., Arria, Caldeira, Bugbee, Vincent, and O'Grady, 2015; Ellickson, Tucker, Klein, and Saner, 2004; Homel, Thompson, and Leadbeater, 2014), and decreases intellectual abilities (Crean, Crane, and Mason, 2011; Jager, Block, Luijten, and Ramsey, 2010; Solowij et al., 2011). Smoking or vaping marijuana can increase the likelihood of adverse health events, such as strokes, heart attacks, or heart disease (Jeffers, Glantz, Byers, and Keyhani, 2024; LaMotte, 2024). Prior research also finds that secondhand marijuana smoke is just as dangerous as primary marijuana smoke (Moir et al., 2008; Chambers et al., 2023; LaMotte, 2023; LaMotte, 2024). Marijuana use is also tied to a decrease in workforce productivity (Hara, Huang, Weiss, and Hser, 2013).

reached $1.5 billion in Colorado and $1.3 billion in Washington in 2023.[2] The distribution of marijuana not only creates jobs directly related to its growth and distribution but also generates ancillary positions in fields such as accounting, law, construction, service, and healthcare to support the growth in the overall economy.

Yet, these economic benefits may be tempered by factors such as taxation and potential negative externalities. Some states impose both excise and sales taxes on recreational marijuana, which can reduce the quantity sold, increase prices, and decrease overall welfare. For example, Colorado imposes a 15% sales tax and a 15% excise tax on marijuana, while Washington levies a 37% tax. Furthermore, marijuana distribution could introduce negative externalities, such as reduced workforce productivity, lower educational attainment, cognitive impairments, and increased crime (Cheng et al., 2023). If significant, these factors may diminish or counteract some economic advantages of legalization, underscoring the need for careful empirical evaluation.

Between 2012 and 2019, multiple states—including Colorado, Washington, Oregon, California, Massachusetts, Illinois, and others—legalized marijuana for recreational purposes. However, the legalization of marijuana does not immediately result in its distribution within these states. States typically require substantial time to establish regulatory frameworks governing marijuana production, sales, and distribution. For example, Hollingsworth, Ling, and Bradford (2022) highlight that recreational dispensaries commonly open one or more years after legalization, reflecting the considerable lag between policy enactment and marijuana becoming practically accessible.

[2] Legal recreational marijuana sales have grown substantially over the years. For example, the Colorado Department of Revenue reported over $1.5 billion dollars in recreational marijuana sales 2023, which is 224% larger than recreational marijuana sales in 2014. The Washington State Liquor and Cannabis Board reports that recreational marijuana sales have increased from $180 million in 2015 to $1.3 billion in 2023, which is a 600% increase.

Recognizing this critical distinction, we leverage the staggered openings of recreational marijuana dispensaries—rather than legalization dates—to assess their impacts on local economic outcomes and household finances. Using a staggered difference-in-differences approach, we exploit county-level variations in dispensary openings within and across states. Prior studies have primarily focused on state legalization dates alone, potentially overlooking substantial delays in dispensary availability (e.g., Illinois allowed distribution months after legalization, whereas Maine took four years). [3] Our methodological approach thus addresses this limitation by precisely identifying the timing of actual marijuana availability, enabling clearer causal inferences regarding recreational marijuana's effects on local economic activity, household financial stability, and personal creditworthiness.

We begin by examining how the opening of a recreational dispensary impacts the local economy and household finances, using county level data on population, GDP, personal income, and housing prices. We estimate several specifications with different fixed effects structures. First, we include state and year fixed effects, which allows us to exploit the staggered availability of recreational marijuana within each state. Second, we substitute state fixed effects with county fixed effects to control for county level characteristics and exploit the staggered availability of marijuana within each county. Third, we substitute county fixed effects with state-year fixed effects, which allow us to exploit variation in the availability of marijuana within each state-year. Overall, we find an increase in population, personal income, and housing prices after a recreational dispensary

[3] The legal distribution of recreational marijuana may not occur for many years after its legalization. For example, Maine legalized the recreational use of marijuana in 2016, but the first recreational marijuana dispensary opened in Maine on October 9, 2020, which is approximately 4 years after the passage of the law. District of Columbia (2015) legalized recreational marijuana on February 26, 2015; however, the District of Columbia does not allow for the traditional purchase of marijuana (Pineda, 2018). Marijuana must be "gifted" or "donated" by the vendor rather than sold; therefore, technically no recreational dispensaries exist in the District of Columbia. In addition to the previously mentioned states, Illinois is not included in our sample because the first recreational marijuana dispensary did not open until January 1, 2020, which is after the end of our sample period.

opens in the state and in the county.[4] Our results suggest that the distribution of marijuana positively impacts the local economy and household finances.

Next, we focus in on how the distribution of recreational marijuana affects personal creditworthiness. If individuals utilize the gains from the improved local economy (e.g., higher personal income) to pay down debts, we anticipate a decline in derogatory loans and accounts with third-party collections, along with an increase in individual credit scores. Moreover, the local economic growth may stimulate the demand for professionals (e.g., accountants, lawyers, medical professionals), who are more likely to have stronger personal finances. An improvement to the population, personal income, and housing prices does not necessarily imply an improvement to personal creditworthiness. For example, higher housing prices, a consequence of the economic growth in counties with dispensaries, could elevate the cost of living, potentially resulting in a reduction to disposable income and tighter financial conditions for residents. Additionally, the distribution of marijuana may lead to higher usage rates, which may adversely affect personal finance decisions.[5]

Utilizing credit data from Equifax and a specification with the same fixed effects structures discussed above, we find that the opening of a recreational dispensary in the state and in the county is associated with improvements in individuals' creditworthiness. Specifically, we document a decrease in the percentage of derogatory accounts, decrease in accounts in collections, increase in credit scores, and reduction in subprime credit scores. These results suggest that the legal distribution of recreational marijuana positively impacts personal creditworthiness.

[4] Our housing price results are similar to Burkhardt and Flyr (2019) in that we both document higher housing prices near the opening of marijuana dispensaries. Our results differ from Burkhardt and Flyr (2019) in that we provide evidence that housing prices in the entire county of a marijuana dispensary increase. We also extend the results from Burkhardt and Flyr (2019) to states other than Colorado.

[5] Hollingsworth, Ling, and Bradford (2022) provide evidence that adult (adolescent) marijuana usage increases 25% (10%) relative to the past year when a recreational marijuana dispensary opens compared to a 5% (negligible effect) increase when a medical marijuana dispensary opens.

Next, we explore the extent to which the availability of recreational marijuana disproportionately affects underserved counties, particularly those with lower educational attainment and higher minority populations. The decriminalization of recreational marijuana has the potential to redirect law enforcement resources towards addressing more severe crimes, which could lead to significant improvements in the local economy, household finances, and personal creditworthiness in areas where residents were previously more likely to face prosecution for minor marijuana-related offenses. By avoiding prosecution and incarceration for the possession of small quantities of marijuana and the associated negative employment consequences, individuals in these communities can remain active in the workforce, thereby enhancing their economic stability. Additionally, the legalization of recreational marijuana can create job opportunities in these areas, ranging from cultivation and retail positions to ancillary services such as security and transportation.

Our results indicate that the opening of a recreational dispensary disproportionately benefits counties with a higher percentage of lower-educated and minority populations. Specifically, we find that the distribution of recreational marijuana in these counties results in greater improvement to local population growth, GDP, housing prices, derogatory accounts, and accounts subject to collections. Our findings suggest that the positive economic and financial impacts of recreational marijuana are particularly concentrated in counties with higher proportions of underserved social groups, highlighting the potential for marijuana legalization to contribute to reducing economic disparities.

Finally, to better understand the localized economic impacts of recreational marijuana dispensaries, we conduct a contiguous county pair analysis. By identifying contiguous counties that straddle state lines we can compare the economic outcomes between these paired counties.

This analysis allows us to assess whether the positive effects of dispensary openings are confined to the counties hosting the dispensaries or if they extend to neighboring counties in other states.

We identify contiguous counties from Dube, Lester, and Reich (2011) and create a sample of contiguous county pairs with pair identifiers. We include county pair fixed effects in our regression models to control for shared characteristics and unobserved heterogeneity between the paired counties. This enables a more precise estimation of the differential impact of dispensary openings on treated counties (where recreational marijuana is legal and a dispensary is open) versus non-treated counties (where marijuana remains illegal or a dispensary is not open). We find that counties with dispensaries experience significantly greater improvements in population growth, GDP, income, housing prices, derogatory accounts, accounts in collections, and subprime credit scores compared to their neighboring counterparts across the state line where marijuana is still illegal. These results suggest that recreational marijuana disproportionately benefits counties where marijuana is legal and available.

Our study makes several important contributions to existing literature. First, it bridges a critical gap in the economics and household finance literature by providing novel empirical evidence that recreational marijuana legalization positively impacts local economic activity and household financial health—areas largely overlooked in prior research focused predominantly on health or crime outcomes. By linking the legalization of marijuana directly to tangible improvements in personal creditworthiness, our findings significantly broaden the scope of the marijuana legalization debate, emphasizing household-level financial consequences alongside broader economic effects.

Second, we also contribute to the growing empirical literature on household finance that examines the effects of societal and governmental policy changes on personal creditworthiness.

Prior research has shown that policy initiatives, such as Medicaid expansions, can significantly alleviate household financial distress by reducing medical debt, missed payments, reliance on high-cost borrowing, and the prevalence of accounts in collections (Allen et al., 2017; Bornstein et al., 2023; Miller et al., 2021; Gallagher et al., 2019b; Goldsmith-Pinkham et al., 2020). Extending this literature, we provide novel evidence showing that policies related to the legalization and distribution of recreational marijuana similarly enhance personal financial outcomes. Specifically, we find that increased access to recreational marijuana is associated with notable reductions in derogatory accounts and accounts sent to collections, along with substantial improvements in credit scores. By highlighting marijuana legalization as an additional channel through which policymakers can positively influence household financial health, our findings underscore the broader economic significance of drug policy reform, adding an important dimension to ongoing discussions of household financial resilience and economic policy.

Third, our study provides critical insights into the heterogeneous impacts of marijuana legalization on historically marginalized and economically disadvantaged communities, connecting drug policy reform directly to broader discussions on economic equity and social justice. Prior literature emphasizes that marginalized groups face significant barriers to financial stability, including disparities in access to capital and credit (Beck, 2020; Fairlie, Robb, & Robinson, 2022), and policy changes often disproportionately affect economic opportunities and credit availability for vulnerable populations (Akey, Heimer, & Lewellen, 2021). Our findings build upon this evidence, showing that counties with higher minority and lower-educated populations experience notably greater economic and financial improvements following the introduction of recreational marijuana dispensaries. These results suggest that marijuana

legalization can act as a targeted economic intervention, potentially reducing persistent socioeconomic disparities related to income, wealth, and credit access.

Nevertheless, our findings should be considered within the context of ongoing debates and evolving policy frameworks. Given the relatively recent wave of marijuana legalization, our study captures short-to-medium-term impacts, leaving the long-term socioeconomic consequences an open question. Future research should continue to monitor and evaluate these effects comprehensively.[6] Yet, despite this limitation, our analysis offers compelling initial evidence that recreational marijuana legalization yields substantial economic and financial benefits, enriching policy discussions and laying critical groundwork for further inquiry into this important policy shift.

2. Legalization of Marijuana in the United States

2.1. A Brief History

Marijuana has been used for medicinal purposes since the 1600's in the United States. It was not until the early 1900's, people in the United States began to use marijuana for recreational purposes. The negative sigma grew over the next thirty years, culminating in the United States Congress passing the Marijuana Tax Act in 1937. The Marijuana Tax Act criminalized the use of marijuana outside its use for specified medical and industrial purposes. The Boggs Act of 1952 and Narcotics Control Act of 1956 set mandatory sentences for possession of marijuana of 2 to 10 years with a fine of up to $20,000. The decriminalization of marijuana began in the 1970's by reducing or eliminating penalties for the possession of pre-specified amount of marijuana. For

[6] Prior research suggests that some of the positive effects associated with the legalization of medical marijuana reversed over a long-time horizon. For example, Bachhuber, Saloner, Cunningham, and Barry (2014) provide evidence that opioid overdose mortality rates slowed after the legalization of medical marijuana; however, Shover, Davis, Gordon, and Humphreys (2019) found that this association became positive when the data was extended to 2017.

example, the state of Texas reduced the penalty for possessing less than two ounces of marijuana from a felony to a misdemeanor (Smith, 1973). However, the Anti-Drug Abuse Act of 1986 established additional mandatory sentences for the possession of marijuana.

California became the first state to legalize marijuana for medical purposes in the Compassionate Use Act of 1996. The Act exempted patients or the patient's caregivers from criminal liability for possessing and cultivating marijuana for medical purposes.[7] Oregon, Alaska, and Washington followed California in 1998 by legalizing marijuana for medical purposes. As of 2024, a total of 37 states have legalized medical marijuana. In 2012, Colorado and Washington were the first states to legalize marijuana for recreational purposes. Colorado passed Amendment 64 that allowed individuals over the age of 21 to possess up to 2 ounces of marijuana. Washington passed Initiative 502 that allowed individuals over the age of 21 to possess up to 1 ounce of marijuana, 16 ounces of edibles, and 72 ounces marijuana in liquid form. As of 2024, 22 other states have passed laws allowing the use of marijuana for recreational purposes.[8] While many states have similar possession and distribution laws, some states are unique. For example, the District of Columbia legalized recreational marijuana in 2015 but does not allow for the traditional sale or purchase of recreational marijuana. Marijuana must be "gifted" or "donated" by the vendor rather than sold (Pineda, 2018).

In 2022, President Joe Biden stated that he would pardon anyone convicted of a federal crime involving the possession of marijuana (Ovalle and Nirappil, 2024). In April 2024, President Biden proposed marijuana to be reclassified from a Schedule I drug to a Schedule III drug. Other

[7] https://oag.ca.gov/system/files/media/medicinal-cannabis-guidelines.pdf
[8] The following are states that have legalized marijuana for recreational purposes: Alaska (2014), California (2016), Colorado (2012), Delaware (2023), District of Columbia (2015), Illinois (2019), Maine (2016), Maryland (2022), Massachusetts (2016), Michigan (2018), Minnesota (2023), Missouri (2022), Montana (2020), Nevada (2016), New Jersey (2020), New Mexico (2021), New York (2021), Rhode Island (2022), Ohio (2023), Oregon (2014), Vermont (2020), Virginia (2021), and Washington (2012).

Schedule I drugs include heroin, ecstasy, and LSD. Other Schedule III drugs include ketamine, Tylenol with codeine, and anabolic steroids.

2.2. Distribution

Despite legalization of recreational marijuana, an individual's access to marijuana for recreational purposes is not immediate. States need time to regulate and control the production and distribution of recreational marijuana. For example, the first recreational marijuana dispensary in Colorado opened on January 1, 2014 more than a year after the passage of the recreational marijuana in 2012. Colorado established "seed-to-sale" tracking, which required marijuana plants to have barcodes so that regulators could track the growth, production, and sale of the marijuana to the end-user (Hill, 2024). In addition, Colorado needed time to determine the appropriate number of licenses to give to recreational marijuana distributors. Other states have taken similar approaches with varying delays between legalization and distribution. On one hand, Illinois legalized recreational marijuana in 2019, and the first recreational marijuana dispensary opened on January 1, 2020, which is less than a year after the law passed. On the other hand, Maine legalized the recreational use of marijuana in 2016, and the first recreational marijuana dispensary opened on October 9, 2020, approximately 4 years after the passage of the law.

Despite the extensive regulation of marijuana found in each state, the recreational marijuana market has grown substantially over the years. The Colorado Department of Revenue reported over $1.5 billion in recreational marijuana sales 2023, which is 224% larger than recreational marijuana sales in 2014. Recreational marijuana sales in the state of Colorado represent 88% of total marijuana sales (including medical sales) in 2023 and only 44% of total sales in 2014. The Washington State Liquor and Cannabis Board reports that recreational marijuana sales have increased from $180 million in 2015 to $1.3 billion in 2023, which is a 600%

increase. The excise tax revenue generated from recreational marijuana sales in Washington increased from $45 million in 2015 to $465 million in 2023.

With almost half of the states in the United States legalizing recreational marijuana, understanding its effects on cognitive development, health, societal safety, local economy, and household finance is of principal importance. Thus, academics, politicians, and practitioners have become increasingly interested in the effects of marijuana on societal and household outcomes as the acceptance, decriminalization, legalization, and availability of marijuana continues to spread throughout the United States. We focus our examination on how the local economy, household finance, and personal creditworthiness are impacted after the legal distribution of marijuana for recreational purposes begins.

3. Data and Identification Strategy

3.1. Data

Our study utilizes a meticulously constructed panel data set to measure the impact of recreational marijuana legalization on various socio-economic indicators. Our data encapsulates a broad spectrum of variables ranging from local economic factors to household finance characteristics, influenced by the dynamic landscape of marijuana legalization and its associated policies in the United States.

Our analysis utilizes data from the RAND Corporation's Opioid Tools and Information Center Resources (RANDOPTIC). This dataset offers a comprehensive list of cannabis policy dates at the state level, spanning from 1990 to 2019. This resource is instrumental in identifying the adoption of both medical and recreational marijuana legalization, as well as the initiation of retail sales for these purposes. Our sample covers the period from 2000 to 2019, during which 11

states legalized recreational marijuana use.[9] While the legalization of recreational marijuana represents a significant event for a state and its citizens, the legalization does not equate to the distribution of recreational marijuana. Therefore, we also obtain the date the first recreational marijuana dispensary opened in each state from RANDOPTIC. Our focus is on the distribution of recreational marijuana, rather than its legalization, as the critical policy variable because legalization does not always suggest the state's citizens have access.

To enhance the granularity of our study and to more accurately measure the impact of marijuana accessibility at the local level, we also collect data on recreational marijuana dispensary openings at the county level from Data Axle. This data enables us to precisely pinpoint the date the first recreational marijuana dispensary opens in each county, providing a more detailed measure of when dispensaries begin distributing recreational marijuana within local communities. Precise dates for recreational dispensary openings at the county-level allows us to exploit variation in the distribution of marijuana within each county and state, allowing us to reduce endogeneity concerns. The incorporation of dispensary opening dates augments our understanding of the spatial and temporal dynamics of marijuana legalization and its consequent socio-economic effects at a more localized scale.

We merge the data on the distribution of marijuana, described above, to two distinct samples. We use the first sample to examine the effect of recreational marijuana on local economic growth and household finances. The first sample spans from 2001 to 2019 and consists of 58,614 county-year observations. It includes local economic characteristics (e.g., population, GDP, personal income) obtained from the Bureau of Economic Analysis (BEA), housing price data from

[9] The following states legalized recreational marijuana during our sample period after Colorado and Washington: Alaska (2014), California (2016), District of Columbia (2015), Illinois (2019), Maine (2016), Massachusetts (2016), Michigan (2018), Nevada (2016), and Oregon (2014). No counties in Illinois are treated in our sample because Illinois did not open a recreational dispensary until January 1, 2020.

the Federal Housing Price Agency, and demographic information (e.g., education levels, percentage of population belonging to a minority group) from the Census Bureau's American Community Survey.

We dive deeper into how the distribution of recreational marijuana impacts household finances by focusing our subsequent analyses on personal creditworthiness. To examine personal creditworthiness, we obtain data from Equifax to create a panel dataset consisting of 45,667 county-year observations between 2005 and 2019 that includes a variety of measures capturing different dimensions of households' financial health (e.g., derogatory accounts, accounts in collections, and credit ratings).[10] Similar to the first sample, we supplement the second dataset with county demographics data from Census Bureau's American Community Survey. This sample covers 3,048 counties across 50 states in the United States and the District of Columbia.

3.2. Identification Strategy

The staggered legalization and distribution of recreational marijuana allows us to conduct a natural experiment examining the causal effects of how recreational marijuana affects the local economy and household finances. Prior studies use variation in the legalization of marijuana across states to study how legalization affects societal outcomes (e.g., Brown et al., 2023). As previously mentioned, the passage of a law legalizing marijuana does not suggest that the state's citizens can legally purchase marijuana. Therefore, using the legalization date rather than the distribution date may increase the likelihood of spurious results. We use the first date a recreational marijuana dispensary opens in the state to test how recreational marijuana impacts the local economy and household finances. We use the following empirical model.

$$DepVariable_{ijt} = \beta\ Treatment_{jt} + \gamma\ Medical_{jt} + Fixed\ Effects + \varepsilon_{ijt} \quad (1)$$

[10] We begin the sample in 2005 because this is the earliest year for which we have access to the Equifax data.

DepVariable$_{ijt}$ represents each of our dependent variables for local economic growth and household finance at county *i*, state *j*, in year *t*. This includes the county's population (*Population*), GDP (*CountyGDP*), personal income (*PersonalIncome*), housing price index (*HousingPrc*), percentage of derogatory accounts (*Derogatory*), percentage of accounts in collections (*Collection*), average credit scores (*VantageScore*), and percentage of individuals with a subprime credit score (*Subprime*). *Treatment* is equal to one in the year the first recreational dispensary opens in the state and thereafter. In all cases, medical marijuana was legalized prior to recreational marijuana; therefore, we include an indicator variable equal to one during the year a medical marijuana dispensary opened in the state (*Medical*). More detailed variable definitions can be found in Table 1 and Table 5.

We estimate Equation (1) with two fixed effects structures. In the first specification, we include state and year fixed effects, which allows us to control for unmodeled state-invariant effects and macro-economic conditions. In the second specification, we include county and year fixed effects, which controls for unmodeled county-invariant effects and macro-economic conditions. The two-way fixed effect structure implemented in Equation (1) converts the empirical specification to a difference-in-difference model, which allows us to compare states that establish a recreational dispensary to those that do not. We cluster standard errors by county to correct for potential serial correlation (Petersen, 2009).

In our next specification, we exploit the opening of recreational dispensaries at the county level to develop tighter empirical tests and narrowly identify the effects of recreational marijuana, which helps reduce unobservable factors that could be present in the state level analyses. In Equation (2), we replace *Treatment*$_{jt}$ with *TreatmentDispensary*$_{ijt}$, which is equal to one when recreational marijuana is both legal and available through a registered dispensary at county *i*, in

state j, in year t, and zero otherwise. $TreatmentDispensary_{ijt}$ allows us to exploit how the staggered availability of recreational marijuana at the county level impacts the local economic growth and household finance variables after a recreational dispensary opens in each county. $DepVariable_{ijt}$ and $Medical_{jt}$ are as previously defined. See Equation (2) below.

$$DepVariable_{ijt} = \beta\ TreatmentDispensary_{ijt} + \gamma\ Medical_{jt} + Fixed\ Effects + \varepsilon_{ijt} \quad (2)$$

We estimate two fixed effects structures using Equation (2). The first fixed effects structure includes county and year fixed effects, which allows us to exploit the variation within each county and year. More specifically, county and year fixed effects allow us to examine how the opening of recreational marijuana dispensary impacts the local economy, household finance, and personal creditworthiness within each county. The second fixed effects structure includes state-by-year fixed effects, which allows us to control for unmodeled economic conditions within each state-year and eliminates the need for $Medical_{jt}$. Because not all recreational marijuana dispensaries open at the same time across all counties within a state, we are able to include state-by-year fixed effects to control for the legal and regulatory environment within each state-year and exploit the effects of opening a recreational marijuana dispensary within each county. State-by-year fixed effects also allow us to control for variation in other state-level economic factors that vary by year. For example, state-by-year fixed effects control for variation in unemployment rates across states and over time. Counties that do not open a recreational dispensary serve as control observations to those that do.

4. Local Economic and Household Finance Results

4.1. Descriptive Statistics

Panel A of Table 1 describes the sample and presents summary statistics of the variables used in the local economic growth analysis described in Equation (1). The mean value of *Population* is equal to 98,935. The mean value of *CountyGDP* is 5.1 billion, the mean value of *PersonalIncome* is 4.2 billion and the mean value of the housing price index (*HousingPrc*) is 133.95 in our county-year level sample. Medical dispensaries exist in roughly 8% of the county-years in our sample (*Medical*). Recreational marijuana dispensaries exist in approximately 2% of the state-year observations (*Treatment*) and 1% of the county-year observations (*TreatmentDispensary*).

In Panel B of Table 1, we further disaggregate the sample by state to better understand the dispersion of counties with a recreational dispensary within each state. The last column of the table indicates the first year that a recreational dispensary opens in each state. Column 2 indicates the total number of county-years found in the sample. Column 3 (4) is the value of *Treatment* (*TreatmentDispensary*) for each state found in our sample. As expected, states that have had recreational dispensaries open the longest have a higher percentage of county-year observations with a functioning recreational dispensary.

4.2. Primary Results

It is unclear how the distribution of marijuana for recreational purposes impacts the local economy and household finance. On one hand, the legal distribution of recreational marijuana increases the quantity supplied, reduces prices, and increases total welfare. Therefore, both consumer and producer surplus associated with recreational marijuana likely increase after the legal distribution of recreational marijuana begins. The distribution of recreational marijuana brings a new industry to the local economy, which could create jobs, attract new residents, and increase tax revenues. The positive population flows could be directly related to the marijuana

trade (e.g., marijuana production and distribution) or support industries (e.g., accountants, lawyers, medical professionals). As the economy is stimulated and the population increases, the legalization of marijuana could also spur an increase in the local GDP, housing prices, and personal income. For example, the Colorado Department of Revenue reported that total recreational marijuana sales exceeded $1.5 billion in 2023.[11] Recreational marijuana sales represented 88% of total marijuana sales in Colorado during 2023. In addition, recreational marijuana distributors in Colorado are not allowed to reduce taxable income with operating expenses, which increased total tax revenues for Colorado (Hill, 2024).

On the other hand, the positive economic impact associated with the distribution of recreational marijuana could be offset by taxes or produce negative externalities. The taxes levied by states are often high. For example, Washington (Arizona) [California] requires a 37% (16%) [15%] excise tax on recreational marijuana sold.[12] These taxes reduce the total welfare gained from the legalization and distribution of recreational marijuana. In addition, negative externalities may develop from the increased consumption of marijuana. For example, prior research suggests that marijuana usage has a negative impact on the health of primary and secondhand users, workforce productivity, and education levels, and possibly increases overall crime.[13] These negative externalities will likely have a negative impact on population, personal income, housing prices, and GDP. Therefore, these potential negative externalities could lead to a contraction in the local economy and negative population flows. Thus, it is an empirical question on whether the legal

[11] https://cdor.colorado.gov/data-and-reports/marijuana-data/marijuana-sales-reports

[12] Not all states levy excise taxes on recreational marijuana sales. For example, Alaska requires as high of a tax equal to 50 dollar per ounce of recreational marijuana sold.

[13] Prior research finds that heavy marijuana use decreases one's IQ (Fried, Watkinson, James, and Gray; 2002), hinders academic achievement in grade school and college (e.g., Arria, Caldeira, Bugbee, Vincent, and O'Grady, 2015; Ellickson, Tucker, Klein, and Saner, 2004; Homel, Thompson, and Leadbeater, 2014), and decreases intellectual abilities (Crean, Crane, and Mason, 2011; Jager, Block, Luijten, and Ramsey, 2010; Solowij et al., 2011). Hara, Huang, Weiss, and Hser (2013) provide evidence that marijuana use decreases workforce productivity.

distribution of recreational marijuana will have a positive or negative effect on local economic growth and household income.

Table 2 presents the results from estimating Equation (1). Overall, we find evidence consistent with an improvement in local economic growth and household finance following the opening of a recreational dispensary in the state. Columns 1, 3, 5, and 7 present the results including state and year fixed effects. Columns 2, 4, 6, and 8 present the results including county and year fixed effects. Columns 1 and 2 include the results with *Population* as the dependent variable. Using both fixed effect structures, we find a positive and significant (1% level) coefficient on *Treatment*, which suggests that a county's population increases between 2.5% to 3.6% after a recreational dispensary opens in the state. When *CountyGDP* is the dependent variable, we only find a positive and significant (1% level) coefficient on *Treatment* when county and year fixed effects are included (Column 4). The coefficient on *Treatment* in Column 4 suggests that the distribution of recreational marijuana increases the county's GDP by 3.3%. The positive and significant (1% level) coefficients on *Treatment* in Columns 5 and 6 suggest that the average personal income increases between 6.0% and 7.1% after the distribution of recreational marijuana begins in the state. Lastly, we find a positive and significant (1% level) coefficient on *Treatment* in Columns 7 and 8 when *HousingPrc* is the dependent variable. The positive coefficients suggest that housing prices increase approximately 9.6% after a recreational dispensary opens within the state.

Table 3 presents results from estimating Equation (2). Panel A estimates the relation using the full sample of counties from all 50 states. Similar to the results found in Table 2, we find evidence in Panel A that is consistent with an improvement in local economic growth and household finance following the opening of a recreational dispensary in the county. Columns 1, 3,

5, and 7 present the results that include county and year fixed effects. The results suggest a 6.4% increase in population, 5.6% increase in the county's GDP, 10.1% increase in personal income, and a 11.3% increase in housing prices. Columns 2, 4, 6, and 8 present the results including state-by-year fixed effects. The results suggest a 4.1% increase in population, 5.0% increase in personal income, and a 3.2% increase in housing prices. These results are particularly informative on the impact of recreational marijuana, because they exploit cross-sectional variation in the distribution of recreational marijuana within each state, which hold the regulatory and political environment constant. Overall, the results suggest that the local economy grows and household finances improve after the distribution of recreational marijuana begins in the county. Figure 2 plots the annual time trends of these effects, which exhibit a marked increase in county population, county-level GDP, personal income, and housing prices following the county's first opening of a recreational dispensary.

Panel B of Table 3 repeats the analysis focusing on the counties from the eight states that begin the distribution of recreational marijuana during our sample period. After eliminating county-year observations that do not begin distribution of recreational marijuana during our sample period, we find similar results. This specification ensures that our findings are not influenced by counties in states that did not begin distributing recreational marijuana during our sample period.[14]

4.3. Cross-sectional Demographic Results

Next, we examine whether the distribution of recreational marijuana has disproportionate effects on different socio-economic groups, particularly focusing on counties with higher

[14] In additional robustness tests, we control for the county's population when *CountyGDP* and *PersonalIncome* are the dependent variables In Table 2 and 3. We continue to find positive and significant coefficients on *Treatment* and *TreatmentDispensary* when *PersonalIncome* is the dependent variable.

percentages of minorities and less-educated citizens. This analysis is motivated by the hypothesis that marginalized communities, which historically face greater economic disadvantages and barriers to financial stability (Beck, 2020), may experience more pronounced benefits from the legalization of recreational marijuana. Prior research has shown that minority-owned start-ups and individuals in underserved communities often struggle with access to capital and financial services, which exacerbates economic disparities (Fairlie, Robb, & Robinson, 2022). Additionally, the politicization of consumer credit and other financial policies can further influence the financial well-being of these populations, often to their detriment (Akey, Heimer, & Lewellen, 2021). Given these challenges, we hypothesize that the economic benefits of marijuana legalization, such as increased local economic activity and improved personal creditworthiness, may be especially significant for these socio-economic groups.

We rank the counties into quartiles based on the percentage of the population that is a minority and the percentage of the population with a bachelor's degree. We then interact an indicator variable representing each of these quartiles with the $TreatmentDispensary_{ijt}$ variable from regression equation (2).[15] Counties with *MinorityQurartile* equal to one (four) have the lowest (highest) percentage of the population that is a minority, and counties with *EduQuartile* equal to one (four) have the lowest (highest) percentage of the population with a bachelor's degree. Table 4 presents these cross-sectional estimation results. The coefficient on *TreatmentDispensary* represents the effect in the counties that belong to the first quartile, which is being used as the benchmark. The coefficients on the interaction terms represent the incremental effects in the

[15] Equation (2) exploits the variation in the distribution of recreational marijuana at the county-level. $TreatmentDispensary_{ijt}$ more precisely identifies the local distribution of recreational marijuana. The $Treatment_{jt}$ measure, which is used in Equation (1), is equal to one when any recreational dispensary in the state opens.

counties that belong to each quartile, relative to the effect in the counties that belong to quartile one.

Panel A of Table 4 shows that the increase in local population, county-level GDP, and housing prices following the recreational dispensary openings is concentrated in those counties with a high percentage of minority population. Specifically, we find that counties in the highest minority quartile experience an incremental 3.9% increase in population growth, a 9.8% increase in GDP, and a 13.2% increase in housing prices following the opening of a recreational marijuana dispensary. These results remain robust regardless of whether we consider the full sample of counties or exclusively concentrate on those within states that eventually legalize recreational marijuana during our sample period.

Similarly, Panel B of Table 4 shows that the opening of a recreational marijuana dispensary disproportionately benefits those counties where individuals are less educated (*EduQuartile = 1*). In these counties, we observe an 8.1% increase in population, a 7.9% increase in GDP, a 10.6% increase in personal income, and a 13.6% increase in housing prices as indicated by the coefficient on *TreatmentDispensary*. We find a negative and significant coefficient on the interaction between *TreatmentDispensary* and *EduQuartile = 4* in the *Population*, *CountyGDP*, and *HousingPrc* regressions. The negative coefficient suggests that the effect of the distribution of recreational marijuana on these local economic outcomes is diminished for areas with higher levels of education. These findings suggest that areas with lower educational attainment incrementally benefit from the economic uplift and improved financial stability following the opening of recreational marijuana dispensaries.

The economic magnitudes suggested in Table 4 indicate that the positive effects of recreational marijuana dispensary openings are not uniform across all communities but are instead

more pronounced in socio-economically disadvantaged areas. The significant increases in population, GDP, and housing prices highlight the potential for the distribution of recreational marijuana to contribute to economic revitalization in minority and low-education communities.

5. Personal Creditworthiness Results

We next conduct a more thorough examination of how the distribution of recreational marijuana impacts household finance by focusing on personal creditworthiness. Specifically, we examine how the distribution of recreational marijuana affects these important factors associated with personal creditworthiness: the percentage of derogatory accounts (*Derogatory*), the percentage of accounts in collections (*Collection*), average credit scores (*VantageScore*), and the percentage of individuals with subprime credit scores (*Subprime*).[16]

5.1. Descriptive Statistics

We present the descriptive statistics for the creditworthiness sample in Table 5. For the average county in our sample, approximately 21% of individuals have derogatory accounts (*Derogatory*), 26% of individuals have accounts in collections (*Collection*), and 19% of credit scores are subprime (*Subprime*). The average value of *VantageScore* in the sample is equal to 700.47. We also find that approximately 11% of county-years have an open medical marijuana dispensary. Approximately 3% of county-years have an open recreational dispensary in the state, and approximately 1% of county-years have an open recreational dispensary in the county.

5.2. Primary Results

[16] Detailed variable definitions can be found in Table 5. Table 5 describes the sample and presents summary statistics of the variables used in the household finance analysis.

We begin our analysis of how the distribution of recreational marijuana impacts personal creditworthiness by replacing the dependent variable in Equation (1) with the previously mentioned creditworthiness measures: percentage of derogatory accounts (*Derogatory*), percentage of accounts in collections (*Collection*), logged credit scores (*VantageScore*), and percentage of individuals with a subprime credit score (*Subprime*). $Treatment_{jt}$ and $Medical_{jt}$ are measured as previously defined in Equation (1). We also employ the same fixed effect structures at the state, county, and year level to account for state and county-specific characteristics and time trends. Standard errors continue to be clustered at the county level.

We present the creditworthiness results in Table 6. Generally, we find that personal creditworthiness improves following the opening of a recreational dispensary in the county. In Columns 1, 3, 5, and 7, we include state and year fixed effects. We find a 1% reduction in derogatory accounts, a 0.9% reduction in accounts in collections, a 0.5% increase in credit scores, and a 0.9% reduction in the proportion of subprime credit scores following the opening of a recreational dispensary. In Columns 2, 4, 6, and 8, we substitute state fixed effects with county fixed effects, which allows for a more precise treatment of the influence of recreational marijuana on personal creditworthiness, to find similar results.

Next, we exploit within-state variation in the opening of dispensaries at the county level by replacing the dependent variable in Equation (2) with the creditworthiness measures previously described. *TreatmentDispensary* is the primary independent variable of interest in Equation (2). Panel A of Table 7 estimates the relation using the full sample of counties from all 50 states. In Columns 1, 3, 5, and 7, we include county and year fixed effects. We find a 1% decrease in the percentage of derogatory accounts, 1.2% decrease in accounts in collections, a 0.6% increase in credit scores, and a 1% reduction in the percentage of subprime credit scores. Similarly, in

Columns 2, 4, 6, and 8, we include state-by-year fixed effects, which allows us to exploit the cross-county variation in the timing of the recreational dispensary openings within the state-year. Thus, all state-year specific variation (e.g., unemployment) is controlled with the state-by-year fixed effects. We find a 0.6% reduction in the percentage of accounts in collections, 0.3% increase in credit scores, and a 0.4% decrease in the percentage of subprime credit scores when including state-by-year fixed effects.

Panel B of Table 7 repeats this analysis on the sample counties in the eight states that begin distributing recreational marijuana during our sample period. Under this specification, we continue to find that recreational dispensary openings lead to a reduction in accounts with third-party collections, and increase in credit scores, and a decrease in the percentage of subprime credit scores using both fixed effects structures.

5.3. Cross-sectional Demographic Results

Prior research in household finance has extensively documented the challenges faced by low-income and minority communities in achieving financial stability. Factors such as limited access to credit, higher rates of derogatory accounts, and subprime credit scores have been shown to impede economic mobility and perpetuate cycles of poverty (Agarwal, Chomsisengphet, & Liu, 2020; Gyourko, Linneman, & Wachter, 1999). We study how the effects of recreational dispensary openings vary cross-sectionally with counties' demographic characteristics by interacting $TreatmentDispensary_{ijt}$ with separate indicators for the quartiles for the percentage of minorities (*MinorityQuartile*) and the percentage of the population with a bachelor's degree (*EduQuartile*). The cross-sectional estimation results are presented in Table 8. The coefficient on *TreatmentDispensary* represents the benchmark effect in the counties that belong to the first quartile for each cross-sectional variable. The coefficients on the interaction terms represent the

incremental effects of a dispensary opening on personal creditworthiness in counties that belong to each quartile, relative to the effect in the counties included in the first quartile.

Panel A of Table 8 shows that the reduction in derogatory accounts and accounts with third-party collections is concentrated in those counties with a higher percentage of the population who are minorities. Specifically, the interaction between *TreatmentDispensary* and the fourth *MinorityQuartile* is negative and significant in column 1 and 2, which suggests that counties in the highest minority quartile experience a 1.5 percentage point greater reduction in derogatory accounts and a 1.5 percentage point greater reduction in accounts in collections compared to counties in the first minority quartile. These results are robust to using the full sample and to using the sample counties in the eight states that eventually legalize recreational marijuana during our sample period.

In a similar manner, Panel B of Table 8 shows a greater improvement to personal creditworthiness following the recreational dispensary opening for counties where individuals have lower levels of educational attainment. Specifically, counties in the first education quartile experience a significant decrease in derogatory accounts, decrease in accounts in collections, decrease in the proportion of subprime credit scores, and an increase in credit scores (i.e., coefficients on *TreatmentDispensary*). Consistent with lower educated counties disproportionately benefiting, we find a positive and significant coefficient on the interaction between *TreatmentDispensary* and the highest quartile of *EduQuartile* in the *Derogatory*, *Collection*, and *Subprime* regressions. This result suggests that the benefits of a dispensary opening are diminished for higher educated counties. Specifically, lower educated counties observe a 1.3 percentage point greater reduction in derogatory accounts, a 0.6 percentage point greater reduction in accounts in

collections, and a 0.7 percentage point greater reduction in the proportion of subprime credit scores for those counties in the lowest education quartile.

Our findings highlight that the positive impacts of recreational marijuana dispensary openings on household finance are not uniformly distributed across all communities. Instead, they are more pronounced in socio-economically disadvantaged areas. The significant reductions in derogatory accounts and accounts in collections, along with improvements in credit scores, suggest that the distribution of recreational marijuana can contribute to economic revitalization in minority and low-education communities. These results underscore the potential of marijuana legalization to promote financial stability and social equity in historically marginalized populations.

6. County Border Pair Analysis

We conduct an additional set of tests focusing on contiguous county pairs that straddle state borders. This analysis helps us assess whether the positive effects of dispensary openings are confined to the counties hosting the dispensaries or if they spill over into neighboring counties. Border counties provide a setting for a natural experiment where the variation in the access to recreational marijuana across state lines creates a sharp contrast in policy environments despite similar geographic, economic, and social conditions.

By focusing on these contiguous county pairs, we can better isolate the localized impact of recreational marijuana distribution. We identify contiguous counties using the county adjacency data from Dube, Lester, and Reich (2011) and create a sample of contiguous county pairs with pair identifiers. This design allows us to employ a DiD framework similar to our primary analysis described in Equation (2), but with the added robustness of county pair fixed effects to control for shared characteristics and unobserved heterogeneity between the paired counties.

Table 9 presents the results of our border discontinuity analysis on local economic growth. We find significant positive effects on population, GDP, and personal income in border counties with a recreational dispensary open compared to adjacent counties. Specifically, counties on the border of states that legalized recreational marijuana with a dispensary experienced a 6.9% increase in population, a 9.9% increase in county-level GDP, a 10.2% increase in county personal income, and a 12.3% increase in housing price.

In Table 10 we analyze the impact of marijuana legalization on personal creditworthiness in border counties. The results suggest a 1.2 percentage point reduction in the proportion of individuals with derogatory accounts, a 0.8 percentage point reduction in the proportion of individuals with accounts in collections, an average increase in credit scores of 0.5%, and a 0.9 percentage point reduction in the proportion of subprime credit scores. These results indicate a significant improvement to counties with an open dispensary compared to adjacent counties.

Overall, our border discontinuity analysis provides robust evidence supporting the positive economic and financial impacts of recreational marijuana legalization. The significant results for treated border counties reinforce our primary findings and highlight the localized benefits of marijuana dispensary openings, demonstrating that the economic and financial gains are largely concentrated within the counties with open dispensaries.

7. Conclusion

This study provides robust empirical evidence on the economic impacts of legalizing recreational marijuana by analyzing local economic activity and household finance outcomes across various U.S. states. By leveraging a staggered difference-in-differences model and a border

discontinuity design, our research offers novel insights into how the distribution of recreational marijuana influences local economic growth and household finances.

Our findings suggest that the distribution of recreational marijuana through dispensaries significantly enhances local economic conditions. Specifically, we observe increases in population, county-level GDP, personal income, and housing prices in counties that opened dispensaries relative to non-dispensary counties. These substantial improvements suggest that the introduction of recreational marijuana dispensaries contributes positively to the economic vitality of local communities. We also find a significant improvement in personal creditworthiness. The distribution of recreational marijuana is associated with a decrease in the percentage of individuals with derogatory accounts, a decrease in the percentage of accounts in collections, an increase in average credit scores, and a reduction in the percentage of individuals with subprime credit scores. These findings underscore the beneficial impact of recreational marijuana on personal creditworthiness and financial stability.

Importantly, our study also highlights that these economic and financial benefits are disproportionately realized in counties with higher percentages of minority and lower-educated populations. Our findings indicate an improvement to social equity by suggesting the legal distribution of marijuana may help alleviate economic disparities in historically marginalized communities. Finally, our border discontinuity analysis further reinforces our inferences by isolating the localized effects of recreational marijuana in border counties. The significant treatment effects for border counties confirm the localized benefits of marijuana dispensary openings and provide additional robustness to our primary findings.

Overall, our research contributes to the ongoing policy debate by providing comprehensive evidence of the economic and financial advantages of legalizing recreational marijuana.

Policymakers considering marijuana legalization can draw from our findings to better understand its potential to stimulate local economies, enhance personal financial health, and promote social equity. As more states move toward legalization, we view further analysis to be crucial to fully understand the multifaceted effects of this policy shift including the long-term impacts of marijuana legalization, potential negative externalities, health consequences, and broader societal outcomes.

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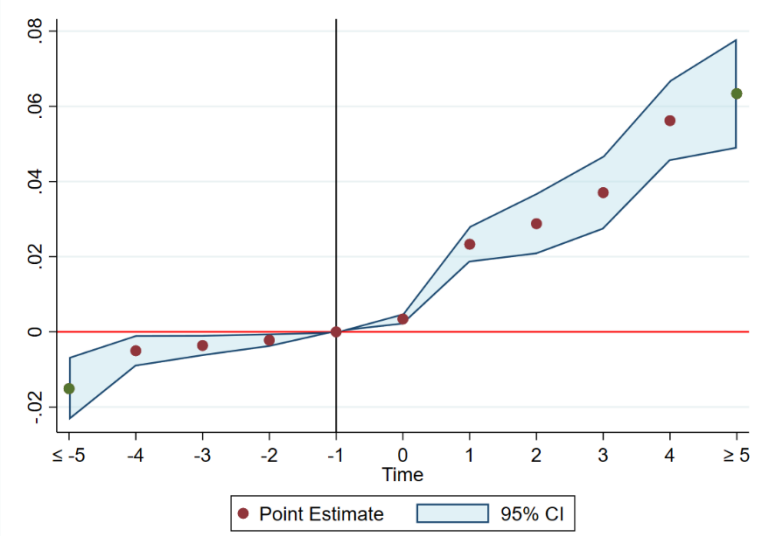
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Figure 1

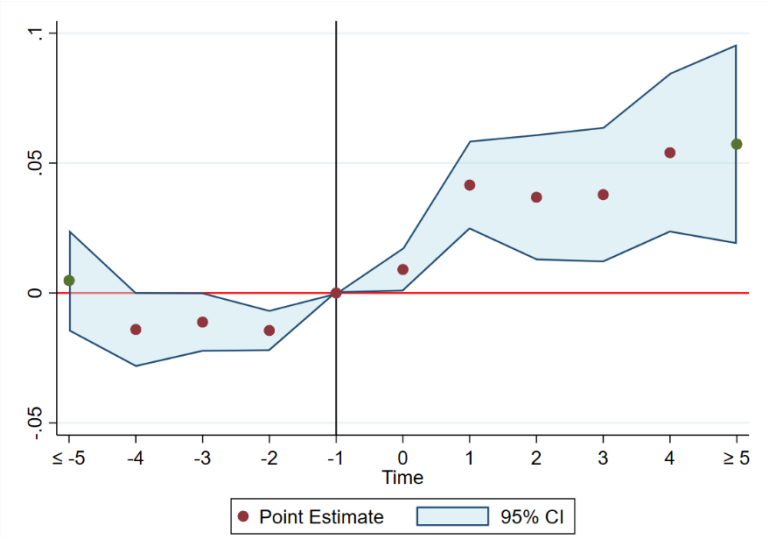
State Level Recreational legalization Treatment level Analysis: Growth

This figure plots the annual time trend in how the county's population, GDP, personal income, and housing price change when recreational marijuana is both legalized and a recreational dispensary exists in the state (*Treatment*). The horizontal axis depicts time relative to when the county receives treatment, *Time=0* being the initial treatment year. County and Year fixed effects are included, and standard errors are clustered by County. The shaded areas represent a 95% confidence interval.

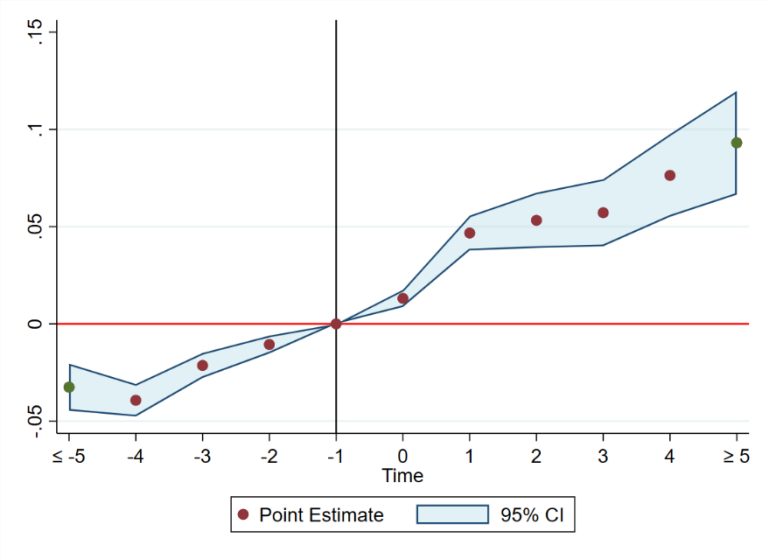
Panel A. Population



Panel B. CountyGDP



Panel C. PersonalIncome



Panel D. HousingPrc

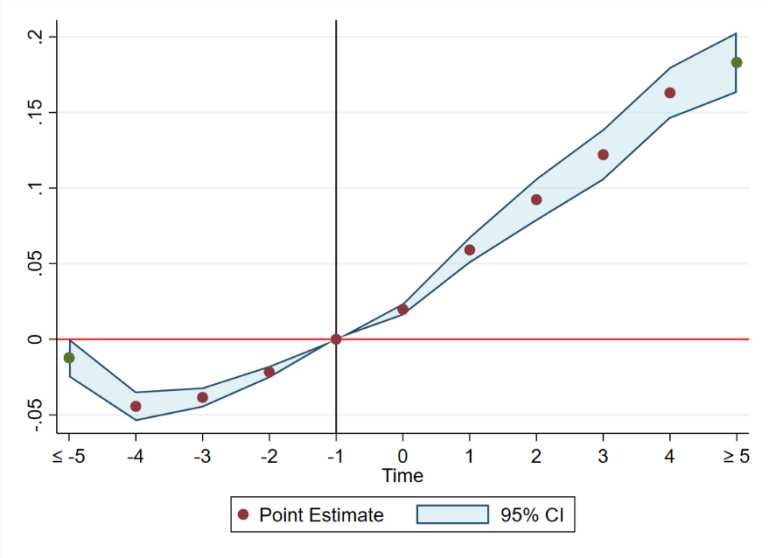
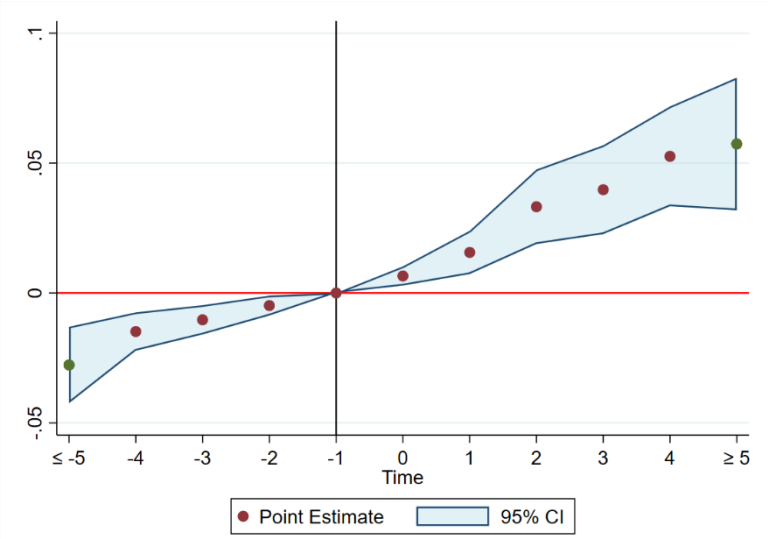


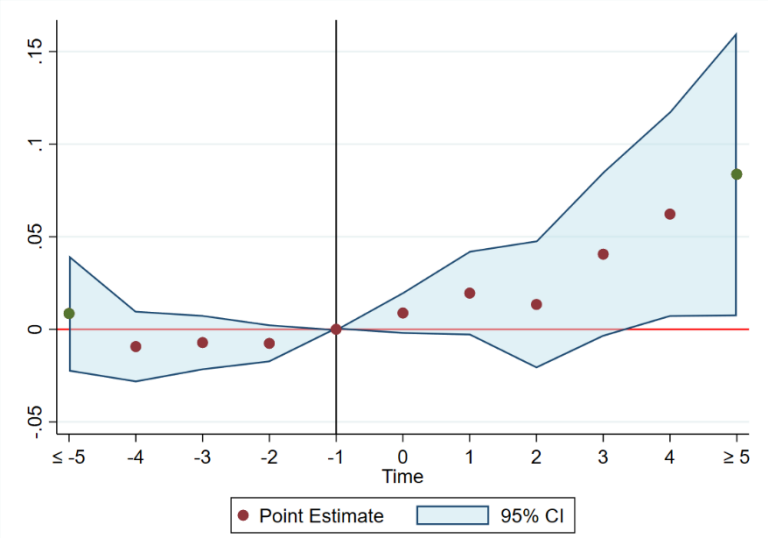
Figure 2
Country Dispensary Opening Treatment Analysis: County Growth

This figure plots the annual time trend in how the county's population, GDP, personal income, and housing price change when recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level (*TreatmentDispensary*). The horizontal axis depicts time relative to when the county receives treatment, *Time=0* being the initial treatment year. County and State×Year fixed effects are included, and standard errors are clustered by County. The shaded areas represent a 95% confidence interval.

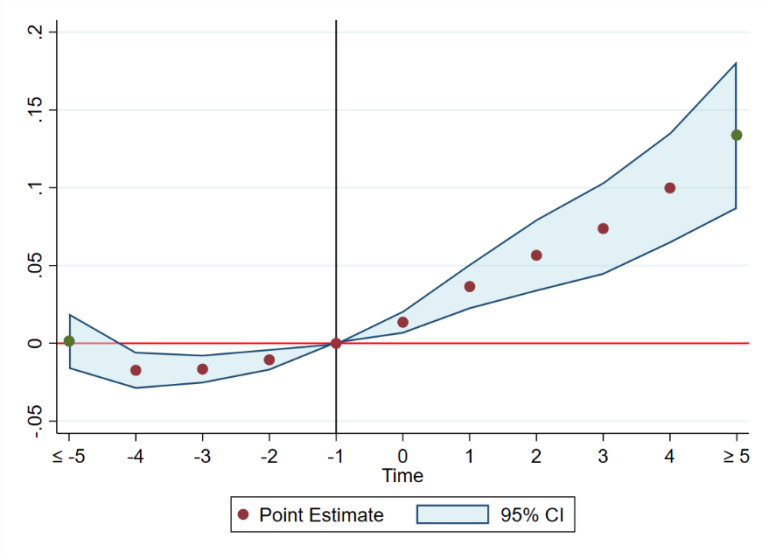
Panel A. Population



Panel B. CountyGDP



Panel C. PersonalIncome



Panel D. HousingPrc

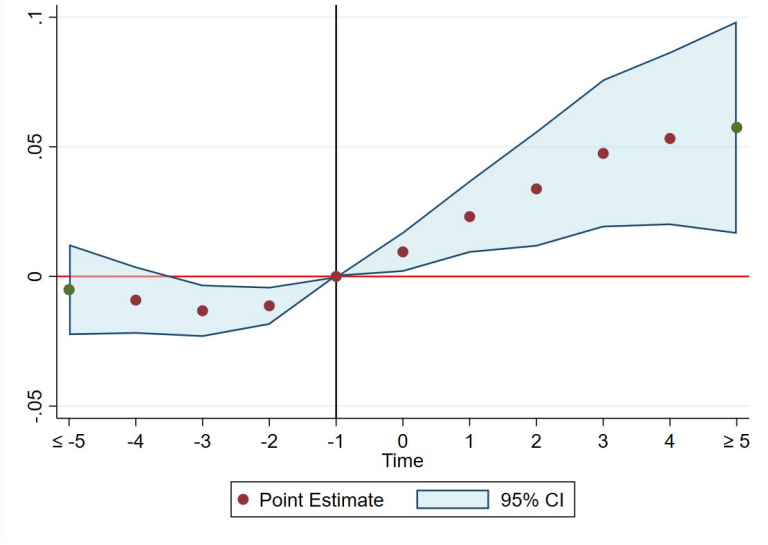


Table 1
Growth Sample Descriptives

This table describes the sample used in the growth analysis. The sample period covers county-years from 2001 to 2019. Panel A presents the summary statistics for our main variables. *Population* is the county's population. *CountyGDP* is county GDP in thousands of chained 2012 dollars. *PersonalIncome* is personal income in the county in thousands of dollars. These variables are from the Bureau of Economic Analysis (BEA). *HousingPrc* is housing price index with 2000 base from Federal Housing Price Agency. We present descriptive statistics of unlogged, raw values of these variables and log-transform these variables in our regression analysis. *Treatment* is an indicator variable that equals one in state-years where recreational marijuana is both legalized and a recreational dispensary exists in the state, and zero otherwise. *TreatmentDispensary* is an indicator variable that equals one in county-years where recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level, and zero otherwise. *Medical* is an indicator variable that equals one if medical marijuana is both legalized and a medical dispensary exists in the state, and zero otherwise, and it takes a monthly fractional value if such condition is met during a given year. *MinorityQuartile* ranges from one to four depending on average percentage of minority (non-white) population in a given county prior to 2014. *EduQuartile* ranges from one to four depending on average percentage of population with a bachelor's degree in a given county prior to 2014. These variables are based on 2009 through 2013 data from Census Bureau's American Community Survey. Panel B describes the *Treatment* variable and *TreatmentDispensary* variable across states.

Panel A. Summary Statistics

Variable	N	Mean	SD	Q1	Median	Q3
Population	58,614	98,935	320,000	10,990	25,576	66,518
CountyGDP	58,614	5,100,000	22,000,000	340,000	870,000	2,500,000
PersonalIncome	58,614	4,200,000	16,000,000	340,000	800,000	2,300,000
HousingPrc	45,002	133.95	26.15	114.93	128.77	146.26
Treatment	58,614	0.02	0.14	0.00	0.00	0.00
TreatmentDispensary	58,614	0.01	0.09	0.00	0.00	0.00
Medical	58,614	0.08	0.27	0.00	0.00	0.00
MinorityQuartile	58,614	2.50	1.12	1.00	2.00	3.00
EduQuartile	58,614	2.50	1.12	1.00	2.00	3.00

Panel B. Treatment and TreatmentDispensary across states

State	N	Mean (*Treatment*)	Mean (*TreatmentDispensary*)	First Year of *Treatment*
AK	494	0.23	0.04	2016
AL	1,273	0.00	0.00	.
AR	1,425	0.00	0.00	.
AZ	285	0.00	0.00	.
CA	1,102	0.11	0.06	2018
CO	1,215	0.32	0.11	2014
CT	152	0.00	0.00	.
DC	19	0.00	0.00	.
DE	57	0.00	0.00	.
FL	1,273	0.00	0.00	.
GA	3,021	0.00	0.00	.
HI	57	0.00	0.00	.
IA	1,881	0.00	0.00	.
ID	836	0.00	0.00	.
IL	1,938	0.00	0.00	.
IN	1,748	0.00	0.00	.
KS	1,995	0.00	0.00	.
KY	2,280	0.00	0.00	.
LA	1,216	0.00	0.00	.
MA	266	0.11	0.07	2018
MD	456	0.00	0.00	.
ME	304	0.00	0.00	.
MI	1,577	0.05	0.01	2019
MN	1,653	0.00	0.00	.
MO	2,185	0.00	0.00	.
MS	1,558	0.00	0.00	.
MT	1,064	0.00	0.00	.
NC	1,900	0.00	0.00	.
ND	1,007	0.00	0.00	.
NE	1,767	0.00	0.00	.
NH	190	0.00	0.00	.
NJ	399	0.00	0.00	.
NM	627	0.00	0.00	.
NV	323	0.16	0.02	2017
NY	1,178	0.00	0.00	.
OH	1,672	0.00	0.00	.
OK	1,463	0.00	0.00	.
OR	684	0.26	0.14	2015
PA	1,273	0.00	0.00	.
RI	95	0.00	0.00	.
SC	874	0.00	0.00	.
SD	1,235	0.00	0.00	.
TN	1,805	0.00	0.00	.
TX	4,826	0.00	0.00	.
UT	551	0.00	0.00	.
VA	1,558	0.00	0.00	.
VT	266	0.00	0.00	.
WA	741	0.32	0.14	2014
WI	1,368	0.00	0.00	.
WV	1,045	0.00	0.00	.
WY	437	0.00	0.00	.
Total	58,614	0.02	0.01	

Table 2
State-Level Legalization Analysis: Economic Growth

This table estimates how the county's population, GDP, personal income, and housing price change when recreational marijuana is both legalized and a recreational dispensary exists in the state (*Treatment*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Variables	*Population*		*CountyGDP*		*PersonalIncome*		*HousingPrc*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.025***	0.036***	0.018	0.033***	0.060***	0.071***	0.096***	0.096***
	(3.68)	(7.98)	(1.42)	(2.88)	(6.71)	(10.63)	(16.23)	(16.18)
Medical	0.009***	0.005*	−0.021***	−0.026***	−0.005	−0.009**	−0.019***	−0.019***
	(2.70)	(1.78)	(−2.91)	(−3.78)	(−1.13)	(−2.27)	(−4.74)	(−4.64)
N	58,614	58,614	58,614	58,614	58,614	58,614	45,002	45,002
Adj. R^2	0.31	0.99	0.27	0.99	0.31	0.99	0.63	0.77
State FE	Yes	No	Yes	No	Yes	No	Yes	No
County FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 3
County-Level Dispensary Analysis: Economic Growth

This table estimates how the county's population, GDP, personal income, and housing price change when recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level (*TreatmentDispensary*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Panel A. Full Sample Analysis

Variables	*Population*		*CountyGDP*		*PersonalIncome*		*HousingPrc*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	0.064***	0.041***	0.056***	0.022	0.101***	0.050***	0.113***	0.032***
	(12.27)	(5.23)	(4.67)	(1.12)	(13.18)	(4.32)	(13.23)	(3.34)
Medical	0.007**	.	−0.024***	.	−0.002	.	−0.009**	.
	(2.45)	.	(−3.21)	.	(−0.64)	.	(−2.29)	.
N	58,614	58,614	58,614	58,614	58,614	58,614	45,002	45,002
Adj. R^2	0.99	0.99	0.99	0.99	0.99	0.99	0.77	0.90
County FE	Yes	No	Yes	No	Yes	No	Yes	No
State×Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No

Panel B. Sample of States that Ultimately Receive Treatment

Variables	*Population*		*CountyGDP*		*PersonalIncome*		*HousingPrc*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	0.051***	0.041***	0.050***	0.022	0.064***	0.050***	0.063***	0.032***
	(7.87)	(5.20)	(3.16)	(1.11)	(7.00)	(4.30)	(6.55)	(3.32)
Medical	0.025***	.	0.038***	.	0.015*	.	0.107***	.
	(4.67)	.	(3.07)	.	(1.88)	.	(11.81)	.
N	6,402	6,402	6,402	6,402	6,402	6,402	5,583	5,583
Adj. R^2	0.99	0.99	0.99	0.99	0.99	0.99	0.80	0.90
County FE	Yes	No	Yes	No	Yes	No	Yes	No
State×Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No

Table 4
County-Level Dispensary Analysis: Demographic Cross-Sectional Effects

This table estimates how the relation from Table 3 varies with pre-period percentage of minority population (*MinorityQuartile*) and pre-period percentage of highly-educated population (*EduQuartile*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Panel A. Pre-period Racial Minority

Variables	*Full Sample*				Sample of States that Ultimately Receive *Treatment*			
	Population	*CountyGDP*	*Personal Income*	*HousingPrc*	*Population*	*CountyGDP*	*Personal Income*	*HousingPrc*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	0.033*	−0.012	0.095**	0.011	0.018	−0.025	0.058	−0.051
	(1.67)	(−0.32)	(2.56)	(0.28)	(0.88)	(−0.64)	(1.46)	(−1.30)
TreatmentDispensary	0.034	0.034	0.026	0.090**	0.033	0.034	0.025	0.090**
×(*MinorityQuartile=2*)	(1.47)	(0.74)	(0.62)	(2.17)	(1.42)	(0.74)	(0.59)	(2.09)
TreatmentDispensary	0.028	0.073*	−0.007	0.103***	0.029	0.079*	−0.006	0.109***
×(*MinorityQuartile=3*)	(1.34)	(1.88)	(−0.17)	(2.61)	(1.35)	(1.94)	(−0.15)	(2.68)
TreatmentDispensary	0.039*	0.098**	0.014	0.132***	0.046**	0.121***	0.019	0.173***
×(*MinorityQuartile=4*)	(1.76)	(2.33)	(0.35)	(3.22)	(2.02)	(2.79)	(0.45)	(4.07)
Medical	0.007**	−0.023***	−0.002	−0.009**	0.025***	0.042***	0.015*	0.112***
	(2.48)	(−3.12)	(−0.62)	(−2.14)	(4.75)	(3.36)	(1.92)	(12.50)
N	58,614	58,614	58,614	45,002	6,402	6,402	6,402	5,583
Adj. R^2	0.99	0.99	0.99	0.77	0.99	0.99	0.99	0.80
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Pre-period High Education Percentage

Variables	*Full Sample*				Sample of States that Ultimately Receive *Treatment*			
	Population	*CountyGDP*	*Personal Income*	*HousingPrc*	*Population*	*CountyGDP*	*Personal Income*	*HousingPrc*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	0.081***	0.079***	0.106***	0.136***	0.069***	0.079***	0.071***	0.095***
	(8.33)	(4.73)	(10.06)	(10.62)	(6.76)	(4.01)	(6.03)	(7.10)
TreatmentDispensary	−0.016	−0.030	−0.020	−0.027	−0.018	−0.036	−0.021	−0.037*
×(*EduQuartile=2*)	(−1.13)	(−1.06)	(−1.18)	(−1.36)	(−1.29)	(−1.30)	(−1.25)	(−1.93)
TreatmentDispensary	−0.025	0.006	−0.003	−0.018	−0.026*	0.002	−0.004	−0.026
×(*EduQuartile=3*)	(−1.57)	(0.17)	(−0.13)	(−0.69)	(−1.67)	(0.04)	(−0.18)	(−0.99)
TreatmentDispensary	−0.027**	−0.053**	−0.004	−0.042**	−0.030**	−0.062**	−0.005	−0.056***
×(*EduQuartile=4*)	(−2.14)	(−2.10)	(−0.21)	(−2.14)	(−2.39)	(−2.44)	(−0.32)	(−2.87)
Medical	0.007**	−0.024***	−0.002	−0.009**	0.025***	0.039***	0.015*	0.109***
	(2.48)	(−3.16)	(−0.63)	(−2.24)	(4.77)	(3.19)	(1.90)	(12.01)
N	58,614	58,614	58,614	45,002	6,402	6,402	6,402	5,583
Adj. R^2	0.99	0.99	0.99	0.77	0.99	0.99	0.99	0.80
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 5
Creditworthiness Sample Descriptives

This table describes the sample used in the household finance analysis. The sample period covers county-years from 2005 to 2019, consistent with the Equifax dataset coverage to which we have access. *Derogatory* is the percentage of individuals in a given county that has a non-zero major-derogatory account as of the year-end as per Equifax dataset. *Collection* is the percentage of individuals in a given county that has a non-zero third party collection account as of the year-end as per Equifax dataset. *VantageScore* is the average measure of credit score in a given county as of the year-end as per Equifax dataset. Higher *VantageScore* implies better credit quality. We present descriptive statistics of unlogged, raw values of the *VantageScore* variable and log-transform it in our regression analysis. *Subprime* is the percentage of individuals in a given county that has *VantageScore* below 600 as of the year-end as per Equifax dataset. When calculating these variables, we use the zip code-county crosswalk files from HUD. When there are multiple counties for a given zip code, we assign the observation to the county with the highest population. Variables *Treatment*, *TreatmentDispensary*, *MinorityQuartile*, and *EduQuartile* are as previously defined in Table 1.

Variable	N	Mean	SD	Q1	Median	Q3
Derogatory	45,667	0.21	0.08	0.15	0.20	0.26
Collection	45,667	0.26	0.11	0.18	0.25	0.34
VantageScore	45,667	700.47	24.52	684.40	703.27	718.40
Subprime	45,667	0.19	0.08	0.13	0.18	0.23
Treatment	45,667	0.03	0.16	0.00	0.00	0.00
TreatmentDispensary	45,667	0.01	0.10	0.00	0.00	0.00
Medical	45,667	0.11	0.30	0.00	0.00	0.00
MinorityQuartile	45,667	2.50	1.12	1.00	2.00	3.00
EduQuartile	45,667	2.50	1.12	1.00	2.00	3.00

Table 6
State-Level Legalization Analysis: Creditworthiness

This table estimates how the county's household finance and credit quality change when recreational marijuana is both legalized and a recreational dispensary exists in the state (*Treatment*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Variables	*Derogatory*		*Collection*		*VantageScore*		*SubPrime*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	−0.010***	−0.010***	−0.009***	−0.009***	0.005***	0.005***	−0.009***	−0.009***
	(−6.94)	(−6.92)	(−6.01)	(−5.82)	(8.72)	(9.60)	(−8.47)	(−8.25)
Medical	0.005***	0.005***	0.004***	0.004***	0.000	0.000	0.001	0.001
	(5.36)	(5.27)	(3.78)	(3.70)	(0.26)	(0.36)	(1.18)	(0.95)
N	45,667	45,667	45,667	45,667	45,667	45,667	45,667	45,667
Adj. R^2	0.53	0.88	0.62	0.91	0.52	0.93	0.49	0.87
State FE	Yes	No	Yes	No	Yes	No	Yes	No
County FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7
County-Level Dispensary Analysis: Creditworthiness

This table estimates how the county's household finance and credit quality change when recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level (*TreatmentDispensary*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Panel A. Full Sample Analysis

Variables	*Derogatory*		*Collection*		*VantageScore*		*SubPrime*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	−0.010***	−0.001	−0.012***	−0.006***	0.006***	0.003***	−0.010***	−0.004**
	(−7.19)	(−0.60)	(−7.67)	(−2.89)	(11.40)	(4.26)	(−10.38)	(−2.41)
Medical	0.004***	.	0.003***	.	0.001**	.	−0.000	.
	(3.82)	.	(3.04)	.	(1.73)	.	(−0.26)	.
N	45,667	45,667	45,667	45,667	45,667	45,667	45,667	45,667
Adj. R^2	0.88	0.88	0.91	0.92	0.93	0.93	0.87	0.87
County FE	Yes	No	Yes	No	Yes	No	Yes	No
State×Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No

Panel B. Sample of States that Ultimately Receive Treatment

Variables	*Derogatory*		*Collection*		*VantageScore*		*SubPrime*	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	−0.002	−0.001	−0.010***	−0.006***	0.003***	0.003***	−0.002*	−0.004**
	(−1.02)	(−0.60)	(−4.85)	(−2.87)	(4.29)	(4.24)	(−1.83)	(−2.39)
Medical	−0.007***	.	−0.000	.	−0.001*	.	0.005***	.
	(−3.05)	.	(−0.15)	.	(−1.71)	.	(3.18)	.
N	5,033	5,033	5,033	5,033	5,033	5,033	5,033	5,033
Adj. R^2	0.80	0.82	0.87	0.89	0.92	0.93	0.86	0.87
County FE	Yes	No	Yes	No	Yes	No	Yes	No
State×Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No

Table 8

County-Level Dispensary Analysis: Creditworthiness Cross-Sectional Demographics Effects

This table estimates how the relation from Table 7 varies with pre-period percentage of minority population (*MinorityQuartile*) and pre-period percentage of highly-educated population (*EduQuartile*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Panel A. Pre-period Racial Minority

Variables	*Full Sample*				Sample of States that Ultimately Receive *Treatment*			
	Derogatory	*Collection*	*VantageScore*	*SubPrime*	*Derogatory*	*Collection*	*VantageScore*	*SubPrime*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	−0.006	−0.009	0.010***	−0.012**	0.004	−0.007	0.007***	−0.005
	(−0.80)	(−1.45)	(3.94)	(−2.21)	(0.56)	(−0.95)	(3.03)	(−0.94)
TreatmentDispensary	−0.000	−0.001	−0.004	0.003	−0.001	−0.002	−0.004*	0.004
×(*MinorityQuartile=2*)	(−0.01)	(−0.19)	(−1.58)	(0.59)	(−0.10)	(−0.26)	(−1.75)	(0.65)
TreatmentDispensary	−0.001	0.003	−0.006**	0.004	−0.003	0.002	−0.006**	0.005
×(*MinorityQuartile=3*)	(−0.19)	(0.46)	(−2.24)	(0.78)	(−0.38)	(0.27)	(−2.51)	(0.91)
TreatmentDispensary	−0.015*	−0.015**	−0.001	−0.004	−0.018**	−0.017**	−0.002	−0.003
×(*MinorityQuartile=4*)	(−1.92)	(−2.15)	(−0.44)	(−0.79)	(−2.50)	(−2.18)	(−0.67)	(−0.50)
Medical	0.004***	0.003***	0.001*	−0.000	−0.008***	−0.002	−0.001	0.004***
	(3.60)	(2.82)	(1.87)	(−0.41)	(−3.53)	(−0.75)	(−1.33)	(2.81)
N	45,667	45,667	45,667	45,667	5,033	5,033	5,033	5,033
Adj. R^2	0.88	0.91	0.93	0.87	0.80	0.88	0.92	0.86
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B. Pre-period High Education Percentage

Variables	*Full Sample*				Sample of States that Ultimately Receive *Treatment*			
	Derogatory	*Collection*	*VantageScore*	*SubPrime*	*Derogatory*	*Collection*	*VantageScore*	*SubPrime*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
TreatmentDispensary	−0.018***	−0.016***	0.006***	−0.014***	−0.011***	−0.015***	0.003***	−0.006***
	(−7.19)	(−5.27)	(8.32)	(−8.91)	(−3.95)	(−4.45)	(3.90)	(−3.25)
TreatmentDispensary	0.011***	0.007*	−0.002	0.004	0.012***	0.007*	−0.001	0.003
×(*EduQuartile=2*)	(2.98)	(1.67)	(−1.37)	(1.62)	(3.63)	(1.80)	(−1.14)	(1.22)
TreatmentDispensary	0.007*	0.005	−0.001	0.005*	0.009**	0.006	−0.001	0.005
×(*EduQuartile=3*)	(1.89)	(1.09)	(−0.88)	(1.71)	(2.17)	(1.21)	(−0.74)	(1.53)
TreatmentDispensary	0.013***	0.006*	−0.001	0.007***	0.015***	0.007*	−0.001	0.006***
×(*EduQuartile=4*)	(4.40)	(1.67)	(−0.84)	(3.09)	(4.75)	(1.77)	(−0.66)	(2.74)
Medical	0.004***	0.003***	0.001*	−0.000	−0.007***	−0.001	−0.001*	0.005***
	(3.75)	(3.00)	(1.74)	(−0.30)	(−3.24)	(−0.25)	(−1.67)	(3.09)
N	45,667	45,667	45,667	45,667	5,033	5,033	5,033	5,033
Adj. R^2	0.88	0.91	0.93	0.87	0.80	0.88	0.92	0.86
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 9
County Border Pair Analysis: County Growth

This table uses contiguous border county pairs data at the annual level to estimate how the county's population, GDP, personal income, and housing price change when recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level (*TreatmentDispensary*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Variables	*Population*	*CountyGPD*	*PersonalIncome*	*HousingPrc*
	(1)	(2)	(3)	(4)
TreatmentDispensary	0.069***	0.099***	0.102***	0.123***
	(6.34)	(2.86)	(7.17)	(7.24)
Medical	0.008	−0.037***	0.005	−0.012
	(1.43)	(−2.68)	(0.66)	(−1.44)
N	43,662	43,662	43,662	28,408
Adj. R^2	0.99	0.99	0.99	0.79
County Border Pair FE	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Table 10
County Border Pair Analysis: Creditworthiness

This table uses contiguous border county pairs data at the annual level to estimate how the county's household finance and credit quality change when recreational marijuana is both legalized at the state-level and a recreational dispensary exists at the county-level (*TreatmentDispensary*). *t*-statistics appear in parentheses and are based on standard errors clustered by County. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels (two-tail), respectively.

Variables	*Derogatory*	*Collection*	*VantageScore*	*SubPrime*
	(1)	(2)	(3)	(4)
TreatmentDispensary	−0.012***	−0.008**	0.005***	−0.009***
	(−4.45)	(−2.37)	(5.77)	(−5.60)
Medical	0.001	0.003	0.001	−0.002*
	(0.68)	(1.58)	(1.35)	(−1.85)
N	34,392	34,392	34,392	34,392
Adj. R^2	0.89	0.92	0.94	0.90
County Border Pair FE	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes