

Brill, Alex; Miller, Brian J.; Veuger, Stan

**Working Paper**

## Implications of Cannabis Legalization for the US Federal Budget

AEI Economics Working Paper, No. 2023-16

**Provided in Cooperation with:**

American Enterprise Institute (AEI), Washington, DC

*Suggested Citation:* Brill, Alex; Miller, Brian J.; Veuger, Stan (2023) : Implications of Cannabis Legalization for the US Federal Budget, AEI Economics Working Paper, No. 2023-16, American Enterprise Institute (AEI), Washington, DC

This Version is available at:

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# Implications of Cannabis Legalization for the US Federal Budget

Alex Brill

*American Enterprise Institute*

Brian J. Miller

*Johns Hopkins University and American Enterprise Institute*

Stan Veuger

*American Enterprise Institute and IE University*

AEI Economics Working Paper 2023-16

October 2023

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# Implications of Cannabis Legalization for the US Federal Budget<sup>1</sup>

*Alex Brill*  
*American Enterprise Institute*

*Brian J. Miller*  
*Johns Hopkins University and American Enterprise Institute*

*Stan Veuger*  
*American Enterprise Institute and IE University*

October 2023

## Abstract

Federal legislation to legalize, regulate, and tax cannabis could have significant impacts on the federal budget. While the specific details of any potential cannabis legalization legislation are unknown at present, such reforms are likely to affect both tax receipts and federal outlays through a wide range of mechanisms including excise tax collections, changes in the size and composition of the labor force, and the major federal health care programs. We identify the main federal budgetary implications of legalizing cannabis and estimate their likely magnitude where possible.

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<sup>1</sup> We are grateful to Aatman Vakil and Grant Seiter for excellent research assistance and to Jeffrey Clemens, Benedic Ippolito, Jeffrey Miron, and Vincent Smith for helpful comments. Corresponding author: Stan Veuger, 1789 Massachusetts Avenue NW, Washington, DC 20036, stan.veuger@aei.org.

While the precise contours of future federal legislation and executive action to legalize, regulate, and tax cannabis remain unknown, such policies could have significant impacts on the federal budget. Revenue impacts could arise as a result of new excise taxes, regulatory fees, and changes in labor supply. Outlay impacts could include reduced expenditures on prohibition enforcement and increased expenditures on prescription cannabis and cannabis product regulation, offset by potential cost savings on other healthcare services. Consequences for key public-health and social outcomes, such as crime, traffic fatalities, and educational achievement, could also have both positive and negative budgetary implications.<sup>2</sup>

This paper seeks to identify the main federal budgetary impacts of legalizing cannabis and estimate their potential magnitude where possible. This exercise assumes that federal legislation will legalize, regulate, and tax both medical and recreational cannabis and that states and localities will follow suit. We improve over prior work in this area by analyzing a (much) wider set of sources of federal revenue and spending. For example, while we follow the approach of Miron and Waldo (2010) in some respects, we add to their analysis by studying additional types of revenue from taxes and fees as well as healthcare spending.

The paper is organized as follows. Section I summarizes the legal and budgetary status quo, including state tax-revenue collections. Section II provides an estimate of the likely size of the current illicit cannabis market and the impact of federal legalization on market size. Section III discusses expected federal revenue and outlay effects. Section IV concludes with a discussion of key issues.

## **I. The Status Quo**

As of May 2023, 38 states, three territories, and the District of Columbia have legalized medical cannabis, while 23 states, two territories, and the District of Columbia have legalized cannabis for recreational purposes (see NCSL, 2022, and MPP, 2023). The US Department of Health and Human Services (HHS) recently recommended rescheduling cannabis from schedule I to schedule III, potentially opening up a path to subsequent partial federal legalization through the creation of a pathway for medicinal use as a controlled substance should the Drug Enforcement Agency (DEA) issue a similar finding. Nationwide, more than 58 percent of the US resident population ages 18 and over now live in a state that has legalized cannabis for medicinal purposes, recreational purposes, or both.

Eleven states collected cannabis tax revenue in all 12 months of fiscal year 2022. Auxier and Airi (2022) find that revenues range from \$28.7 million (Alaska) to \$774.4 million (California). On a per-capita basis, Washington state (\$67 million), Colorado (\$61 million), and Nevada (\$48 million) collect the most cannabis tax revenue.<sup>3</sup> As we discuss below, federal legalization is likely to change conditions in the legal cannabis market significantly.

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<sup>2</sup> For more detail on current and potential cannabis tax designs, see Davis, Hill, and Phillips (2019) and Boesen (2020).

<sup>3</sup> Appendix Table 1 provides details on the states that have legalized cannabis, including the most recent statutory language year and per-capita cannabis revenues, if available.

## II. Cannabis Market

A budgetary analysis of cannabis legalization relies heavily on an estimate of the amount of cannabis consumption after federal legalization. A starting point for this estimate is current national retail expenditure on cannabis. From there, one can make adjustments based on how legalization is expected to change both demand and supply.

Existing research on the effect of medical- or recreational-cannabis legalization on cannabis consumption generally finds modest positive effects (e.g., Harper, Strumpf, and Kaufman, 2012; Wen, Hockenberry, and Cummings, 2015; Hollingsworth, Wing, and Bradford, 2022). This suggests that demand will not shift dramatically as further legalization occurs. Therefore, we follow an approach similar to that of Miron and Waldock (2010), who assume that consumption of and spending on cannabis change only due to supply-side shifts in response to legalization.

We begin with a 2016 estimate of national retail expenditures on cannabis from researchers at RAND of \$60.7 billion (in 2022 dollars) (Midgette et al., 2019). We scale this by the increase in the US population and consumer price level from 2016 to 2024 (projected). We also adjust for changes in the 30-day rate of cannabis usage by adults aged 19–30, with data available up to 2020 and extrapolated to 2024. Based on those adjustments, the market in 2024 would be \$95.2 billion, absent any change in policy, as shown in Table 1.<sup>4</sup>

Following Miron and Waldock (2010), we assume that post-federal-legalization prices would be half of current prices, and that the elasticity of demand for cannabis is -0.5. That is, prices would fall in a legal market, as product suppliers would no longer incur the costs associated with federal prohibition, multi-state operators could achieve economies of scale, and consumers would alter their consumption due to lower prices. Under these conditions, we estimate that the cannabis market size in 2024 would be \$59.5 billion (in 2022 dollars), as shown in Table 1.

**Table 1. Estimated Consumer Expenditure Pre and Post Cannabis Legalization**

Consumer Expenditure before Legalization, 2016	\$60.7 billion
Projected Consumer Expenditure without Legalization, 2024 (adjusting for CPI, population, and use growth)	\$95.2 billion
Assumed Price Decline after Legalization	50%
Assumed Elasticity of Demand	-0.5
Percent Decline in Expenditure after Legalization	37.5%
Consumer Expenditure after Legalization	\$59.5 billion

*Notes:* Consumer retail expenditures on cannabis in 2016 were obtained from Midgette et al. (2019), published by the RAND Corporation. To estimate 2024 consumer expenditures (in 2022 dollars), the value from RAND was adjusted for the increase in the US population and consumer price level from 2016 to 2024 (projected) and changes in the 30-day rate of cannabis usage by adults aged 19–30, following Miron and Waldock’s (2010) methodology.

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<sup>4</sup> As an alternative estimate, we update Miron and Waldock’s (2010) extrapolation of the 2000 ONDCP estimate for consumer expenditure on cannabis, \$13.13 billion (in 2000 dollars). Adjusting for inflation, population growth, and increase in drug usage, cannabis market size in 2024 by this method would be \$58.9 billion (in 2022 dollars).

### III. Revenue and Outlay Effects

#### III.1 Federal Revenue

Revenues generated from cannabis legalization will largely depend on tax rates and bases. At the federal level, the most significant revenue source is the excise tax. Other relevant sources of revenue include the corporate income tax, individual income and payroll taxes, potential revenue from increased economic activity, and fee revenue.

##### *Excise Tax Revenue*

If all \$59.5 billion in projected cannabis sales in 2024 were subject to a 10 percent federal excise tax, federal tax revenues would increase by nearly \$6 billion. This estimate is, however, overly high for three reasons.

First, the illicit cannabis market will not be eliminated. Illicit cannabis may be more affordable and/or more accessible than legalized cannabis. Specifically, high tax rates and stringent regulation may deter consumers from purchasing cannabis from legal sources.

Second, if consumption of alcohol, tobacco, or other goods that are subject to an excise tax changes, revenues from those excise taxes change as well. The impact will hinge on the degree to which cannabis is a substitute for or complement to these other products. If cannabis is a complement to alcohol or tobacco, this means that as cannabis consumption increases, so does the consumption of (and tax revenue from) the complementary goods. On the other hand, if cannabis is a substitute for alcohol or tobacco, legalization will lead to a decline in consumption of the substitute goods and, subsequently, a decline in excise tax revenues from those substitutable products.

Empirical evidence indicates that cannabis legalization will likely crowd out existing excise tax revenue by reducing alcohol consumption, based on research on existing legalization efforts. Using individual-level survey data on self-reported alcohol consumption from the Behavioral Risk Factor Surveillance System, Anderson, Hansen, and Rees (2013) and Sabia, Swigert, and Young (2017) find that laws legalizing cannabis for medicinal purposes were associated with decreases in past-month alcohol use. Specifically, Anderson, Hansen, and Rees (2013), using 1993–2010 data, find that these laws were associated with a 4 percent decrease in the probability of past-month alcohol use. Sabia, Swigert, and Young (2017), using 1990–2012 data, find that these laws were associated with a 3.1 percent reduction. Using retail scanner data from US–Canada border county pairs, Baggio, Chong, and Kwon (2020) find that these laws were associated with a 12 percent decrease in retail alcohol sales.

For laws legalizing cannabis for recreational purposes, Miller and Seo (2021) find a 5 percent decrease in alcohol consumption using retail scanner data from Washington state. Extrapolating this result to the federal level, a 5 percent decline in alcohol consumption would reduce federal revenue from the alcohol excise tax by \$500 million.

The recent evidence from cannabis legalization is more mixed about whether cannabis and tobacco are substitutes. In their sample of college-age adults, Alley, Kerr, and Bae (2020) find no

evidence of an association between tobacco use and laws legalizing cannabis for recreational purposes. Anderson, Matsuzawa, and Sabia (2020) use 1991–2017 data from the National and State Youth Risk Behavior Surveys and find that increased cigarette taxes reduce cigarette consumption without affecting cannabis consumption. Miller and Seo (2021), on the other hand, find that laws legalizing cannabis for recreational purposes in Washington state are associated with a 5 percent decrease in cigarette demand.

Third, net excise tax revenue will be lower than gross excise tax revenue due to decreases in income and payroll taxes. When a new excise tax is imposed or existing excise tax rates are increased, the tax burden will be shared by producers and consumers. If the burden of the tax is entirely on producers, their receipts will decrease by the amount of the tax, resulting in a decline in wages and profits. This, in turn, will reduce the individual and corporate income tax and payroll tax bases. On the other hand, if consumers bear the full burden of the tax, the price of the taxed goods will rise by the amount of the tax. This will result in consumers having less money to spend on other goods and services. As consumer spending on non-taxed goods declines, the taxable income of the producers of the non-taxed goods declines, also reducing the individual and corporate income tax and payroll tax bases. This effect is known as the “income and payroll tax offset.” The Joint Committee on Taxation (JCT, 2023) estimates that this offset amounts to roughly one-quarter (24.2–26.6 percent) of excise tax revenues.

A federal cannabis excise tax of 10 percent will therefore certainly yield significantly less, on net, than 10 percent of total revenue in the market. Even ignoring the likely sizeable illicit market, the likely decline in alcohol excise tax revenues and the tax offset effect would reduce the revenues in the example above by more than one-third from nearly \$6 billion to less than \$4 billion. This lower number would still be an upper bound because it assumes no illicit market.

There is also significant uncertainty associated with the size of the post-legalization cannabis market. Miron and Waldock (2010) derive their aforementioned assumption of prices going down by 50% from the experience of the Netherlands under pseudo-legalization. Perrault (2022) finds a short-run black-market price reduction of 18% across a range of decriminalization and partial legalization measures in the United States. As Jacobi and Sovinsky (2016) emphasize, this kind of estimate does not fully account for the changes to access and stigma that would accompany full legalization and likely understates the price drop from full legalization.

Miron and Waldock’s (2010) assumed price elasticity of demand of -0.5 is a relatively conservative one. Hansen et al. (2017), for example, estimate a short-run elasticity of -0.4 and a longer-run elasticity of -1, while Hollenbeck and Uetake (2021) similarly produce an estimate of around -1. Table 2 shows what various assumptions around price effects and demand elasticities would mean for excise tax revenue.

**Table 2. 10 Percent Excise Tax Revenue, Sensitivity Analysis**

Price Decline (percent)	Elasticity of Demand		
	-0.25	-0.5	-1.0
0.25	4.82	4.92	5.14
0.50	3.44	3.86	4.71
0.75	2.27	3.23	5.14

*Notes:* This table shows revenue estimates in billions of 2022 dollars for a 10 percent federal excise tax on cannabis for 2024, adjusted for income and payroll tax offsets and crowding out of alcohol tax revenue, for various assumed price decline and demand elasticities

### *Tariff Revenue*

Turning to the international dimension of the excise tax, we find it unlikely that legal importation of cannabis will be allowed, at least initially. As a result, customs duties will not be collected. However, lawmakers are likely to enact a tariff equivalent to the excise tax, even if imports are initially disallowed.

### *Other Tax Revenue*

Corporate income, individual income, and payroll taxes paid by cannabis producers, wholesalers, retailers, and their employees will constitute additional revenue to the extent that existing untaxed illicit-cannabis activity becomes subject to taxation.

However, existing cannabis businesses will pay lower federal taxes once they can deduct all business expenses, which offsets this positive effect on revenue to some extent. Specifically, Internal Revenue Code Section 280E disallows businesses from claiming deductions for ordinary and necessary business expenses associated with trafficking in schedule I and schedule II controlled substances. Such disallowed expenses include wages and salaries paid to sell product, rent, and marketing costs. However, the cost of goods sold (COGS), known more formally as the “expenditures necessary to acquire, construct or extract a physical product which is to be sold” (*Reading v. Commissioner* (1978)), which is akin to the direct cost of inventory for a retailer, is not excluded by 280E. In short, 280E results in the tax base for cannabis businesses to be gross income, rather than net income. As a result, the effective tax rate on a cannabis business is significantly higher than for an ordinary business permitted to deduct all reasonable costs and expenses. If the DEA recommends, as HHS did, that cannabis be rescheduled from schedule I to schedule III, Section 280E will no longer apply.

The Marijuana Opportunity Reinvestment and Expungement (MORE) Act, H.R. 3617 in the 117th Congress, would have legalized cannabis, thereby exempting cannabis businesses from Section 280E, and imposed an excise tax (phased in to 8 percent) and a \$1,000 annual occupational fee to any “person engaged in business as a producer or an export warehouse proprietor.” JCT estimates that net excise tax revenues would be \$5.66 billion over the period 2023–2031 and other revenues would reach \$2.42 billion over the same period. However, the other revenue stream, according to JCT, would be negative in the first three years before turning positive due to the timing effects of deductions and other expected market dynamics. The expected revenue impact in 2031 alone from the MORE Act is \$1.4 billion.



In the current Congress, H.R. 2643, the Small Business Tax Equity Act of 2023 would amend Section 280E to exclude “marijuana sales conducted in compliance with State law.” Similar legislation has been introduced previously in both the House and Senate. Whether by excluding state-legal cannabis sales from 280E explicitly, rescheduling cannabis by the DEA or by other means such as the removal of cannabis from the schedule of controlled substances by statute, the practical tax effect would be the same, permitting cannabis businesses to deduct all business expenses, not only cost of goods sold. The impact on the business entity would be very significant. Illustrative examples from the cannabis industry indicate such businesses can pay effective tax rates of 70 percent (National Cannabis Industry Association, 2015). The net effect on revenue from corporate income, individual income, and payroll taxes paid by cannabis producers, wholesalers, retailers, and their employees will then depend on the extent to which the rate reduction offsets the base increase.

### *Revenue from Increased Economic Activity*

Assuming a fixed capital stock and constant labor force participation, new cannabis-related economic activity will crowd out both existing activity in other industries and the corresponding tax revenue.<sup>5</sup> It will only generate differential revenue if profit rates and/or wages are greater or lower than in the status quo.

Of course, the assumption of constant labor participation may be unrealistic. Abouk et al. (2021), using Current Population Survey data from 2011 to 2019, find that legalization of recreational cannabis is associated with a decrease in the propensity to receive workers’ compensation benefits and benefit amounts. Based on 2010–2018 National Survey on Drug Use and Health data, the authors suggest that these improvements are a consequence of increased work capacity resulting from an additional form of pain management therapy.

Similarly, Nicholas and Maclean (2019), using data from the 1992–2012 waves of the Health and Retirement Study, find that legalization of medical cannabis has a statistically insignificant effect on self-reported pain but a statistically significant 3.4 percent increase in self-reported health among older Americans. Among the subsample qualifying for medical cannabis use, passage of a law legalizing cannabis for medicinal purposes leads to a statistically significant 4.8 percent reduction in reporting pain and a 6.6 percent increase in self-reported health. Nicholas and Maclean (2019) also found that passage of a law legalizing cannabis for medicinal purposes leads to a 3.8 percent increase in weekly hours worked among older adults conditional on working, with larger effects (6.4 percent) for those qualifying for medical cannabis use, and increases in full-time work (5 percent for the full sample and 7.3 percent for the qualifying subsample).

Chakraborty, Doremus, and Stith (2021), using county-level data from Colorado, find that laws legalizing cannabis for recreational purposes are associated with a 0.7 percentage point decrease in the unemployment rate, a 4.5 percent increase in the number of employees, and no effect on labor-force participation or wages. Conversely, Sabia and Nguyen (2018) find no evidence that

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<sup>5</sup> To the extent that legalization increases measures of economic activity such as GDP by simply recognizing activity that was already taking place, it does not necessarily increase tax revenue. Please refer to the subsection on “Other Tax Revenue,” for a more extensive discussion.

laws legalizing cannabis for medicinal purposes affect employment, hours, or wages among working-age adults. Dave et al. (2022) similarly find little evidence that laws legalizing cannabis for recreational purposes adversely affect labor outcomes.

If labor force participation was to increase, we would expect a corresponding increase in revenue due to the resulting increase in real GDP. For instance, a onetime 0.25 percentage point increase in the labor-force participation rate as a result of legalization would increase the Congressional Budget Office's (CBO's) baseline labor force growth rate from 0.575 percent to 0.815 percent in the first year and slightly higher rates in subsequent three years. Real GDP would be on a higher trajectory. If the labor-force increase occurred in 2025, federal revenues would increase by \$5 billion in 2026 and \$58 billion from 2025 to 2033, relative to the baseline. Additional outlays over the budget window would be expected as well. While mandatory spending would decline by almost \$10 billion, higher interest rates would increase debt financing costs.<sup>6</sup> On net, outlays would be nearly \$22 billion higher over the budget window. Thus, the projected net budgetary effect would be \$37 billion.<sup>7</sup>

### *Fee Revenue*

Most medical products are subject to federal product regulation by the US Food and Drug Administration (FDA) under the Food, Drug, and Cosmetic Act. The FDA is organized into product centers, with regulatory funding provided by annual Congressional appropriations and/or user fees. Most product centers are supported by user fees assessed on product applications, annual product-licensing fees, and plant-inspection fees.

While some proponents have suggested a new center for cannabis product regulation,<sup>8</sup> it is more likely that cannabis and cannabis-derived products will be regulated by existing product centers depending upon their use. For example, prescription medicinal cannabis and cannabis-derived products are likely to be regulated by the Center for Drug Evaluation and Research, while inhaled recreational products would most likely be subject to regulation under a harm-reduction standard akin to the existing "appropriate for the protection of the public health" standard for tobacco products, overseen by the Center for Tobacco Products.

While tobacco products are the sole FDA product under a different user-fee system not subject to reauthorization and associated regular regulatory-process improvement, it is likely that any new products will be regulated under a per-use application and licensing-fee model as other FDA-regulated products are (for example, small-molecule prescription drugs, biologics, medical devices, etc.). Foods and supplements are regulated under a "generally recognized as safe" or GRAS standard for ingredients, noting that molecules that are marketed as prescription drugs are ineligible to be regulated as GRAS. It is likely that food and drink products derived from or containing cannabis will be regulated under this or a similar standard, with a ceiling on the pharmacologically active content level and distribution restrictions.

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<sup>6</sup> The increase in labor supply relative to capital increases the rate of return on private capital thereby increasing interest rates economy-wide, including the cost of financing the federal debt.

<sup>7</sup> These estimates were derived from the workbook that accompanies CBO's publication "How Changes in Economic Conditions Might Affect the Federal Budget: 2023 to 2033."

<sup>8</sup> Cannabis Administration and Opportunity Act of 2022, S.4591, Sec. 1101. Center for Cannabis Products.

In this vein, federal revenue sources will likely include prescription-drug user fees from new drug applications (NDAs) for cannabis and cannabis-derived products (\$3,242,026 per application), annual prescription-drug program fees (\$393,933), and other fees related to manufacturing-plant inspections. While only four cannabis-derived or related products are currently approved (cannabidiol, two versions of dronabinol, and nabilone), it is likely that other product development would be undertaken subsequent to legalization. The magnitude of expected prescription-drug development in the cannabis space is unclear, as a significant portion of current medicinal-cannabis use is likely recreational.

Akin to how supplement manufacturers avoid prescription-drug regulation by making general health claims instead of product claims related to the diagnosis and treatment of disease, it is likely that cannabis product manufacturers and sellers will undertake a similar regulatory-driven market strategy and attempt to be regulated under a harm-reduction standard instead of the safe and effective standard of prescription drugs. We expect that Congress will implement a sunset, five-year user-fee agreement requiring reauthorization for recreational-cannabis product regulation with a harm-reduction standard as the barrier to marketing authorization. Thus, the majority of inhaled cannabis products are likely to have a user-fee framework similar to that of prescription drugs.

With only four currently legally authorized prescription products currently marketed in the United States and the expectation that many cannabis producers and product manufacturers would seek marketing authorization under a harm-reduction standard as opposed to a prescription-drug marketing approval standard, FDA user fees for prescription cannabis products would be expected to remain below \$100 million annually given the high barriers to approval as a prescription drug.

We expect that many cannabis and cannabis-derived products instead will seek marketing authorization under a harm-reduction standard, and thus be subject to a new user-fee agreement. Under this approach, recreational inhaled cannabis products would be regulated by the Center for Tobacco Products, with anticipated implementation of a similar user-fee system. Generously estimating user fees as an average of an NDA for new drugs and premarket approval (PMA) application for devices, the average application fee would be \$1.8 million<sup>9</sup> with an annual product licensing fee estimated at \$438,746, noting that small businesses frequently have significantly reduced fees.<sup>10</sup> Finally, many products may be classified as a supplement, i.e., modification of an existing product instead of a new application, and may not pay the full program fee.

Furthermore, a significant share of the illicit marketplace may not seek marketing authorization. With an estimated 710 currently marketed unique products in states with recreational markets and 1,546 unique products marketed in states with medical use only, user-fee revenues could be

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<sup>9</sup> We calculated a hypothetical recreational-cannabis product application fee as the average of PMA (\$441,547) and NDA (\$3,242,026) filing fees, with data from the Food and Drug Administration. Alternatively, fees may be similar in magnitude to those associated with submission of a 510(k) application (\$21,760).

<sup>10</sup> We calculated a hypothetical recreational-cannabis annual product-licensing fee as the average of PMA (\$483,560) and NDA (\$393,933) fees, with data from the Food and Drug Administration.

significant. If we assume that half of currently marketed recreational products and one-third of currently marketed medical products seek marketing authorization under a harm-reduction standard, recreational-cannabis product user fees would raise an estimated \$1.57 billion in application fees and \$382 million in annual licensing fees. This would provide the FDA adequate resources to establish a cannabis regulatory framework.

Edible and liquid ingestible cannabis-derived products would likely be regulated under a product oversight schema similar to supplements, noting that policymakers would have to provide distinct statutory authority for such a framework as cannabis-derived products are not generally recognized as safe, which is the statutory standard for food additives. Policymakers could also implement a registry fee for foods containing cannabis-derived products, albeit this would deviate from current FDA fee practices.

### *III.2 Federal Spending*

#### *Overall Effects on Healthcare Spending*

Spending on cannabis in the healthcare context is of special interest for current purposes due to the federal government's important role in the financing of healthcare expenditures.

Overall spending levels will depend on consumption and price, as well as the degree to which utilization is a substitute for or complement to other healthcare products. For example, would cannabis medication for oncology patients be a substitute for or a complement to other pain-management treatments? Early preclinical (Nielsen et al., 2017) and clinical-trial evidence (Dun et al., 2021, and Abrams et al., 2011) suggests that cannabinoids may play a role as a complement to or substitute for other prescription drugs for a variety of indications, noting that as cannabis remains a schedule I controlled substance that clinical-trial evidence is mostly limited to the FDA-approved prescription-drug formulations of cannabis's pharmacologically active ingredients.

Observationally, several studies have found that cannabis legalization is associated with a reduction in opioid use and related mortality, suggesting that cannabis and prescription painkillers are substitutes. Bachhuber et al. (2014) find that laws legalizing cannabis for medicinal purposes were associated with a 25 percent reduction in related mortality. Several more recent estimates are similar (e.g., Bradford and Bradford 2016, 2018; Bradford et al., 2018; Powell, Pacula, and Jacobson, 2018; McMichael, Van Horn, and Viscusi, 2020). In contrast, Mathur and Ruhm (2023) find that medical cannabis is associated with higher opioid mortality.

It is possible that, due to the controversy over the nature of the cannabis product marketplace, legalization occurs with a statutory exception excluding cannabis-derived products from Medicare and Medicaid coverage, as is currently the case for some product categories such as weight-loss drugs.<sup>11</sup> However, it is still worthwhile to consider cannabis's potential effects on Medicare and Medicaid spending.

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<sup>11</sup> The Medicare Modernization Act of 2003 excluded these categories from Medicare Part D coverage. A full list of these categories can be found at SSA§1927(d)(2).

One mechanism through which cannabis could affect Medicare and Medicaid spending is through decreased utilization of prescription opioids. Bradford and Bradford (2018) find that legalization of medical cannabis is associated with a significant decline in Part D prescriptions for pain medicines, with the presence of active dispensaries associated with a reduction in 3.742 million daily doses while home cultivation (as opposed to commercial sale) saw a reduction of 1.792 million daily doses. Specifically, hydrocodone use decreased by 17.4 percent when state dispensaries were present versus a 9.4 percent decrement associated with home cultivation. They further suggest that, by 2015, savings to Medicare were as much as \$638.8 million per year as a result of state medical-cannabis laws, and savings from dispensary-based medical-cannabis laws would have been between \$1.4 and \$1.7 billion. Bradford et al. (2018) find that legalization of medical cannabis is associated with an 8.5 percent reduction in Part D prescribing of opioids.

Another counterbalancing factor, in addition to the expense of cannabis products themselves, is the potential for changes in emergency-room visits and substance-abuse treatment. Chu (2015) studies the effects of medical-cannabis laws by analyzing 1992–2011 data on drug arrests and treatment admissions across 15 states that legalized cannabis for medicinal purposes before 2012. He finds that these laws are associated with a 20 percent decrease in admissions to substance-abuse treatment centers for heroin-related treatment, supportive of the negative cross-elasticity of demand between cannabis and opioids. Unsurprisingly, he finds no effects on admissions to treatment centers for cocaine, a short-acting central-nervous-system stimulant, and neither do Conyers and Ayres (2020). The latter do find that for each quarter after Arizona randomly issued licenses to open medical-cannabis dispensaries, opioid-related emergency-room visits increased by 0.8 percent. See Anderson and Rees (2023) for an overview of the broader body of mixed evidence on the cross-elasticity of demand for opioids.

Directly cannabis-related medical care could increase with legalization and drive medical expenditures. Myran et al. (2022) examine emergency-room visits and hospitalization for cannabis hyperemesis syndrome in Ontario and note an increase from 0.26 visits per 100,000 individuals in January 2014 to 3.43 visits per 100,000 individuals in June 2021, with 8.8 percent of visits resulting in subsequent hospitalization. Early evidence (Cerdá et al., 2020) also notes small but significant increases in cannabis-use disorder associated with legalization of recreational cannabis: respondents aged 26 and older who had a cannabis-use disorder increased from 0.90 to 1.23 percent. While the actual expected incidence and prevalence of cannabis-use disorder will likely increase, the cost of treatment is currently unclear.

Cannabis-derived products may eventually play a significant role in the treatment of mood disorders such as generalized anxiety disorder (see Berger et al., 2022, and Stoner, 2017). Consequently, it is expected that prescription cannabis-derived products may have a significant albeit yet unmeasured cross-elasticity with many antidepressants, such as SSRIs and SNRIs. If cannabis is deemed safe and effective for the treatment of the approximately 27 percent of adult Americans with anxiety (CDC, 2022), it could be cheaper than other existing pharmacologic options. It is possible that prescription-drug expenditures could decrease as cannabis-derived products compete with antidepressants.

### *Medicare Spending*

Medicare Part D prescription drug plans (PDPs) will likely impose prior authorization requirements including step therapy, quantity limits, or other restrictions.<sup>12</sup> As the evidence base builds, it is possible that cannabinoid products may become a preferred modality over opioids for the treatment of certain types of pain. It is expected that PDPs will cover FDA-regulated prescription forms of cannabis, but they are unlikely to cover inhaled recreational or edible products. In states that have not yet legalized recreational use, a significant yet unknown share of the current medical cannabis use is likely recreational. Thus, PDPs will likely experience political and policy pressure to cover inhaled recreational and edible forms of cannabis-derived products, and eventually may offer coverage of select products as a supplemental benefit similar to many PDPs' coverage of over-the-counter products. This is at least initially unlikely given the lack of definitive medical evidence for their efficacy and the significant lag time required for the initiation, completion, and promulgation of medical research.

### *Medicaid Spending*

Medicaid is funded jointly by the federal government and the states. In fiscal year 2021, the federal government paid 69.3 percent of Medicaid costs, ranging from 60.2 percent in Wyoming to 84.5 percent in Mississippi (Kaiser Family Foundation, 2023a). Every state includes a prescription-drug benefit in its Medicaid program. While the construction of the Medicaid drug benefit is driven by a myriad of statutes and regulations, drug spending remains a small part of the Medicaid budget, with outpatient prescription drugs representing 5.3 percent of fiscal year 2021 Medicaid spending (MACPAC, 2022).

For a product to be covered it must be FDA-approved, which will likely limit the number of cannabis products available, as it is expected that most cannabis products will either be recreationally inhaled products (with potential quasi-medical consumer use) or edible products. Furthermore, utilization controls are likely to be even stricter in the Medicaid managed-care marketplace noting the effectively open formulary existing in the Medicaid program. It is also possible that cannabis product manufacturers will decline to participate in the Medicaid marketplace due to low reimbursement rates.

Finally, it is worth noting the effects of the different Medicaid financing structures. Among Medicaid beneficiaries, 72 percent receive their health benefits through a managed-care organization paid on a capitated basis (Kaiser Family Foundation, 2023b). As the Medicaid benefits package is relatively rich with low consumer out-of-pocket responsibility, managed-care entities have responded by maintaining programmatic affordability through the deployment of narrow networks and increased utilization review tools, such as prior authorization. Thus, even if covered in some form, it is likely that cannabis products, except those for highly specific uses, will remain out of reach for Medicaid beneficiaries and will not trigger significant new spending.

### *Veterans Health Administration Spending*

The Veterans Health Administration provides health financing and integrated-care delivery for an estimated 9.2 million veterans. While prescription cannabis is unavailable within the VA

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<sup>12</sup> Many health plans have already implemented prior authorization and/or step therapy for dronabinol, a prescription product that is a synthetic THC.

system, several Senators have introduced legislation to permit it as a prescription option. Currently, FDA-approved prescription drugs that include an active ingredient from cannabis (e.g., dronabinol) are available to veterans. If cannabis were legalized under the framework above, it is likely that the number of FDA-approved prescription drugs derived from cannabis products would increase, albeit with a multiyear lag time. Other forms of cannabis would likely remain initially noncovered. Political activity by veterans' service organizations could result in the VA covering other forms of cannabis products, potentially increasing expenditures.

### *Subsidies for Private Health Insurance*

Similar to the Medicare and Medicaid markets, private health-insurance markets may experience slight shifts in product utilization as health exchange enrollees or those with employer-sponsored insurance shift from prescription opioids or recreational tobacco products to cannabis and cannabis-derived products.

In the Affordable Care Act (ACA) exchange market, any FDA-approved prescription cannabis product (including the four currently on the market) would be available to enrollees, albeit likely subject to stringent prior authorization and utilization review requirements. Other forms of nonprescription cannabis would likely remain uncovered, excluding the vast majority of cannabis users whom one would expect to utilize products authorized under a harm-reduction standard. Due to historical policy and political disagreements over the ACA exchange market, this would be unlikely to change.

In the employer-sponsored insurance (ESI) market, cannabis products authorized under a harm-reduction standard would likely be covered by some plans with richer benefits likely due to employee demand, similar to coverage of chiropractor services, acupuncture, and other alternative health modalities. Yet, products would likely be subject to prior authorization and step therapy.<sup>13</sup> As the employed population is significantly healthier than the Medicaid and Medicare populations and would thus likely have less medical demand for cannabis products in a setting of more available access and coverage, the magnitude of the impact of cannabis coverage in the ESI market is likely similar to or less than in the government-financed programs. Thus, cannabis legalization may have very small effects on ESI expenditures, and thus a negligible impact on the tax subsidy for ESI.

### *Farm Subsidies*

If cannabis is grown on land currently used for subsidized crops, it will reduce farm subsidies. A back-of-the-envelope calculation gives a sense of the potential magnitude of the reduction.

The total amount of marijuana produced in the United States last year was estimated to be about 24,000 tons. Yield of dried plant per acre is about 1.3 tons per acre, so production of 24,000 tons would require about 18,000 acres. Last year, the area planted to subsidized crops like wheat corn,

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<sup>13</sup> As an example, the North Carolina State Health Plan implements multiple utilization management tools (prior authorization, step therapy, and quantity limits). See: <https://www.shpnc.org/documents/files/dronabinol-post-limit/open>

soybeans, cotton, rice, and peanuts exceeded 230 million acres—18,000 acres is thus a miniscule share of the subsidized cropland.

While cannabis production may well increase after legalization, not all of it will take place on land previously allocated to subsidized crops. Given that federal farm subsidies have averaged about \$16 billion annually (much more recently due to temporary pandemic relief programs), if 18,000 acres of cannabis production displaced subsidized crop production, subsidy spending would be likely reduced by only a few million dollars.

Of course, if cannabis were to become a federally recognized crop, it is possible that producers would get their own subsidy program. In this context it is important to note that the federal crop-insurance program, Multi-Peril Crop Insurance, already covers hemp for fiber, grain, or CBD (US Department of Agriculture, Risk Management Agency, 2023).

### *Other Federal Spending*

Following Miron and Waldock (2010), we first estimate federal spending on drug enforcement by summing agencies’ final budget authority for drug control in the President’s budget and apportioning funds based on the percentage of cannabis-related arrests.

In 2022, federal spending totaled \$19.1 billion for all drugs. In 2019, the most recent year with FBI data, 2.9 percent of arrests for drug-abuse violations were for marijuana sale or manufacturing, and 32.1 percent for possession; therefore, the total share of drug-abuse arrests for marijuana was 35 percent. Apportioning funds this way brings the total amount spent on cannabis prohibition to \$6.7 billion, as shown in Table 3.

**Table 3. Federal Drug Prohibition Expenditure by Agency**

<b>Federal Department/Agency</b>	<b>All Drugs</b>	<b>Cannabis</b>
DC Court Services and Offender Supervision	70.6	24.7
Department of Defense	1,097.2	384.0
The Federal Judiciary	1,169.1	409.2
Department of Homeland Security	6,418.0	2,246.3
Department of the Interior	8.5	3.0
Department of Justice	9,420.0	3297.0
Office of National Drug Control Policy	449.2	157.2
Department of State	367.2	128.5
Department of Transportation	45.4	15.9
Department of the Treasury	80.1	28.0
<b>TOTAL</b>	<b>19,125.3</b>	<b>6,693.8</b>

*Notes:* Expenditures in millions of 2022 dollars on drug control by different federal agencies were obtained from the National Drug Control Budget, FY 2024 Funding Highlights (March 2023). Expenditures on cannabis were determined by apportioning funds based on the percentage of marijuana arrests (35%), with data from FBI arrest records for 2019 (the most recent available year).

This number is likely to be an overestimate of the potential for spending reductions for at least two reasons. First, one may question whether agencies or departments that devote substantial effort to the source-country side of drug-control policy, like the Defense and State Departments,



allocate their resources across drugs in this fashion. Second, we deem it unlikely that federal legalization of cannabis will lead to immediate or even eventual reductions in these agencies' budgets. Instead of budget cuts, we would expect these agencies to refocus their attention on other law-enforcement activity, with unclear if any consequences for the federal budget.<sup>14</sup>

#### **IV. Discussion**

There will be significant but uncertain budgetary consequences to both revenues and outlays at the federal level if cannabis is legalized.

On the revenue side, the largest potential effect arises from an increase in labor-force participation, though it is hard to say how large that effect will be based on current knowledge. Increases in net tax revenue from an excise tax on cannabis, though complicated by offsetting factors, could be significant as well. Other changes to revenue—from the corporate income tax on cannabis producers, or from FDA fee revenue—are likely to be of a smaller order of magnitude.

On the spending side, the single most important factor in determining the direct budgetary implications of federal legalization of cannabis will be whether cannabis products will be treated as “normal” prescription drugs. If they are, the federal government may well end up picking up a significant share of the bill for spending on cannabis through the Medicare, Medicaid, and veterans' health-insurance programs, though these costs may be offset by reduced spending on other forms of healthcare. If cannabis legalization increases aggregate spending on private health insurance, the tax expenditure for ESI will increase.

A variety of factors limit the likely budgetary outlay effect. Most cannabis companies are likely to seek marketing authorization from the FDA under a harm-reduction or supplement-like regulatory standard, thus excluding them from (mandatory) public-payer coverage. The few companies that seek marketing approval as a prescription drug will likely be up-tiered on health-plan formularies and be subject to utilization review tools such as prior authorization. Thus, most cannabis and cannabis-derived products are likely to be distributed through retail sales channels, subject to significant regulatory restrictions such as adult-only venues (e.g., Virginia state's ABC stores for liquor sales), cannabis-only sales venues with controlled access, or designated as behind-the-counter products.

Medicare Advantage plans and employer-sponsored insurance could potentially cover some nonprescription cannabis products as supplemental benefits. Medicaid managed-care and ACA exchange plans are unlikely to cover these products, given the more political nature and scrutiny of these markets along with the emerging but still weak evidence of clinical efficacy. Furthermore, in the setting of stringent coverage, it is most likely that cannabis products will be used as a substitute for other existing products such as opioids or gabapentin, thus serving as a substitute rather than product-complementary role.

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<sup>14</sup> This may in part be justified by the fact that former marijuana dealers may continue their career in the illicit-drug industry after legalization by substituting toward other illegal drugs (as observed by Xiong, 2021).

Indirect effects of cannabis legalization may also impact federal outlays. For example, if legalization of cannabis leads to a decrease in opioid utilization and a subsequent reduction in mortality from opioid abuse, there would be increased outlays in Medicare and Social Security due to increased longevity.

Many of these budgetary implications are highly contingent on decisions yet to be made by policymakers. Take the excise tax on cannabis, for example. While determining the “socially optimal” excise tax on cannabis is beyond the scope of this paper, it is worth noting the range of considerations associated with such a determination.

In an unencumbered market for a good with a negative externality, an excise tax equal to the difference between the private and social cost of consumption can raise the cost of the good to reflect both private and public costs, curb demand, and generate revenues equivalent to the social harm. However, in a highly regulated market where non-tax measures limit competition (such as licensing restrictions that limit the number of sellers in a market and detailed product regulation), prices will likely exceed marginal cost and reflect an implicit tax. Determining the appropriate excise tax requires knowledge of the social cost of cannabis consumption and the implicit tax arising from regulatory restrictions. If the implicit tax equals or exceeds the optimal tax or if there is no net negative externality, the optimal tax is zero or negative.

For example, Thomas (2019) examines Washington state’s tax and regulatory policies governing cannabis sales and finds that licensing restrictions, which limit the number and location of cannabis sellers, reduce competition and result in higher prices. Washington state’s cannabis tax rate was 37 percent, but Thomas finds that the combination of regulatory and tax policies yielded a demand equivalent to a free-entry market with a 63 percent excise tax. In other words, the regulatory restrictions on sales reduced demand for cannabis by a similar degree as the tax, albeit without generating any state revenue.

This dynamic has potentially important implications for federal cannabis policy, and the appropriate federal excise tax rate—and the appropriate subsidy rate through the federal healthcare programs—should be considered in conjunction with an estimate of the impact of regulatory restriction on competition and price.

Finally, while the budgetary impact of federal legalization of cannabis reflects both the impact on revenues and outlays, it is not necessarily optimal to intentionally set the excise tax regime such that revenues equal outlays. Such an arrangement, where taxes on privately financed consumption funds publicly financed consumption is as appropriate as funding public schools with a tax on private schools. That said, the net budgetary impact of federal legalization is important for reasons of Congressional procedure and politics more generally.

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**Appendix Table 1. State Medical and Recreational Cannabis Laws and Revenues**

	Year Medical Use Legalized	Year Recreational Use Legalized	Total Revenue (\$ Millions, FY 2022)	Per-Capita Revenue (\$ Millions, FY 2022)
Alabama	2021			
Alaska	1998	2014	28.7	39
Arizona	2010	2020	132.8	18
Arkansas	2016			
California	1996	2016	774.4	20
Colorado	2000	2012	353.7	61
Connecticut	2012	2021		
Delaware	2011	2023		
District of Columbia	2010	2014		
Florida	2016			
Hawaii	2000			
Illinois	2013	2019	466.8	37
Kentucky	2023			
Louisiana	2016			
Maine	1999	2016	18.2	13
Maryland	2014	2022		
Massachusetts	2012	2016	156.7	22
Michigan	2008	2018	163.5	16
Minnesota	2014	2023		
Mississippi	2022			
Missouri	2018	2022		
Montana	2004	2020		
Nevada	2000	2016	152.3	48
New Hampshire	2013			
New Jersey	2010	2020		
New Mexico	2007	2021		
New York	2014	2021		
North Dakota	2016			
Ohio	2016			
Oklahoma	2018			
Oregon	1998	2014	170.6	40
Pennsylvania	2016			
Rhode Island	2006	2022		
South Dakota	2020			
Utah	2018			
Vermont	2004	2018		
Virginia	2020	2021		
Washington	1998	2012	517	67
West Virginia	2017			

*Notes:* Data on the years of legalization are from National Conference of State Legislatures (NCSL) (2022) “State Medical Cannabis Laws.” Data on tax revenues are from Auxier and Airi (2022) “The Pros and Cons of Cannabis Taxes.” Research Report, Tax Policy Center.