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Tracking Cannabis in the National Accounts

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Abstract

The internationally agreed guidelines for national economic accounts explicitly recommend that illegal market activity should be tracked together with legal market activity (United Nations Statistics Division 2025). This recommendation is not currently implemented by the U.S. Bureau of Economic Analysis because of challenges inherent in identifying suitable source data (U.S. Bureau of Economic Analysis 2019) and differences in conceptual traditions (Carson 1984). But cannabis may soon be reclassified under federal law (Executive Order 14370 2025). In preparation for that possibility, this paper explores how tracking cannabis could impact the U.S. industry accounts, national accounts, and trade statistics. This paper is an update of a 2021 paper that was written before any cannabis reclassifications.

Cannabis-related output spans farms, manufacturing, wholesale, and retail sectors totaling over $150 billion in 2025. Some cannabis-related output is already included in the economic statistics, and so the net revision to gross domestic product (GDP) is smaller than the industry numbers given earlier. In the national accounts, tracking cannabis may raise the level of nominal GDP by 0.3 percentage point in 2025 and raise real GDP growth between 2010 and 2025 by 0.04 percentage point per year. In the trade statistics, tracking cannabis may lower the level of the nominal trade deficit by 1.4 billion in 2025 and lower the growth of the nominal trade deficit by 0.7 billion per year between 2010 and 2025. These tentative estimates are based on currently available information and subject to revision.

Keywords Marijuana, Cannabis, Illegal, National Accounts, Productivity, Farm, Retail, Manufacturing

JEL codes E01, O17, Q19

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Introduction

The internationally agreed guidelines for national economic accounts, System of National Accounts 2025, explicitly recommend that illegal markets should be tracked together with legal markets:

> *Transactions on unofficial markets that exist in parallel with official markets... must also be included in the accounts, whether or not such markets are actually legal or illegal.*
>
> *Activities that may be illegal but productive in an economic sense include the manufacture and distribution of narcotics, illegal transportation in the form of smuggling of goods and of people, and services such as prostitution.*
>
> *Transactions in which illegal goods or services are bought and sold need to be recorded not simply to obtain comprehensive measures of production and consumption but also to prevent statistical discrepancies appearing elsewhere in the accounts. The incomes generated by illegal production may be disposed of quite legally, while conversely expenditures on illegal goods and services may be made out of funds obtained quite legally. The failure to record illegal transactions may lead to significant errors within the accounts if the consequences of the activity are recorded in the financial account and the external accounts, say, but not in the production and income accounts (United Nations 2025, sections 7.50, 7.52, and 7.53).*

Official guidelines for international transactions, *Balance of Payments and International Investment Position Manual, Sixth Edition* (International Monetary Fund 2009), also recommend that illegal market trade should be tracked together with legal market trade.[1] The recommendation to include illegal market activity in the composition of gross domestic product (GDP), gross domestic income (GDI), and balance of payments (BoP) has been implemented in the European Union. The publication "*The Handbook on the Compilation of Statistics on Illegal Economic Activities in National Accounts and Balance of Payments*" (Eurostat 2018) provides country cases for Australia, Belgium, Colombia, Denmark, Finland, Italy, Luxembourg, the Netherlands, Serbia, Sweden, Ukraine, and the United Kingdom. In addition, France recently included illegal drugs in their national accounts (Agence France-Presse 2018) and Canada recently included illegal cannabis in their national accounts (Barber-Dueck et

[1] The official guidelines for international transactions were updated in 2025. The updated guidelines are shorter and do not discuss illegal goods at all. This paper assumes that the earlier guidance is still in effect.

al. 2018). This paper explores how the United States economic statistics might change if cannabis were tracked like it is in those other countries.

Many people use the words “cannabis” and “marijuana” as synonyms—but these words are defined in slightly different ways under federal law. Cannabis refers to a general plant type. Hemp refers to cannabis plants which contain less than 0.3 percent of the main psychoactive chemical, tetrahydrocannabinol (THC). Hemp has been explicitly legal under federal law since 2018 (Hudak 2018).[2] Marijuana refers to cannabis plants which contain at least 0.3 percent THC. Because it is more general, the remainder of the paper will use the word cannabis whenever possible.

The U.S. Bureau of Economic Analysis (BEA) does not currently track illegal market activity because of challenges in source data (BEA 2019) and different conceptual traditions (Carson 1984). At the same time, BEA does adjust reported market activity for underreporting and misreporting associated with activity that would be legal if it were fully licensed and reported (BEA 2019). At the time this paper draft was written, marijuana was classified as a schedule I drug. But a recent executive order recommended that marijuana be reclassified as a schedule III drug (Executive Order 14370 2025). The definitions of those schedules are given in the same executive order:

> “*Schedule I drugs are defined as drugs with no currently accepted medical use, a high potential for abuse, and a lack of accepted safety for use of the drug under medical supervision. Schedule III drugs are classified as having a potential for abuse less than the drugs or other substances in Schedules I and II, a currently accepted medical use in treatment in the United States, and a potential for moderate or low physical dependence or high psychological dependence in the event of drug abuse.*”

In preparation for a potential future reclassification of marijuana, this paper studies four separate categories of cannabis: federally permitted cannabis, state-permitted medical cannabis, state-permitted recreational cannabis, and unpermitted cannabis. Federally permitted cannabis is defined as cannabis that is explicitly permitted by federal law under either the 2018 definition of hemp or another definition that may be set forth in response to the executive order’s recommendation. State-permitted medical cannabis is explicitly permitted by state law, but not federal law, for medical usage. State-permitted recreational cannabis is explicitly permitted by state law, but not federal law, for nonmedical usage.

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[2] The November 2025 continuing resolution introduced a changed definition of hemp that was scheduled to be implemented in November 2026 (Sacco et al. 2025). The implementation of this change may interact with a December 2025 executive order.

Finally, unpermitted cannabis is all other cannabis. It seems likely that federally permitted cannabis prescriptions would be included in the economic accounts directly. Furthermore, it seems plausible that other cannabis could be included in the economic statistics indirectly.

This updated paper contains three important improvements over the previous paper (Soloveichik 2021). First, this paper uses the 2022 Economic Census and other sources to extend the time series in the previous paper until 2025. Second, this paper uses recent survey questions from the National Survey of Drug Use and Health to refine estimates for unpermitted cannabis consumption, unpermitted cannabis manufacturing, self-employment rates for unpermitted cannabis workers, and other detailed statistics. Third, this paper adjusts some assumptions on intermediate cost shares due to problems with out-of-sample fit. As a result of these improvements, the historical statistics reported in this paper may not match the previous paper. Readers who are interested in the broader question of illegal market activity can get historical data from the more comprehensive paper, "Including Illegal Activity in the U.S. National Economic Accounts" (Soloveichik 2019). Other researchers are studying how tracking illegal drug trade might impact the broader trade accounts (Atkinson 2020).

This paper is divided into four sections. Section 1 describes the current and exploratory treatment of cannabis in the United States. Section 2 presents national data on nominal consumption, nominal production, and nominal intermediate inputs for cannabis. Section 3 presents national data on cannabis prices and input prices. Section 3 then calculates how tracking cannabis impacts real GDP growth and productivity growth. Finally, section 4 discusses the regional impact of tracking cannabis. The results of this paper are exploratory only and subject to revisions from new data or changes in underlying assumptions.

1. Current and Exploratory Treatment of Cannabis

The 2022 Census of Agriculture and the 2022 Economic Census use codes from the 2022 North American Industry Classification System (NAICS) to classify businesses. Cannabis cultivators are part of agriculture and are classified as either 111419 (cannabis grown under cover) or 111998 (cannabis grown in open field). Manufacturers producing edible, drinkable, or smokable cannabis products do not have their own specific NAICS code but are rather included in either 311 (food manufacturing) or 312 (beverage and tobacco manufacturing). Manufacturers producing cannabis-related chemicals or medicines might also

be included in 325 (chemical manufacturing).[3] Wholesalers who sell cannabis products are included in NAICS code of 4245906 (cannabis and marijuana, recreational or medical, merchant wholesalers). Retailers who specialize in selling medical cannabis products are likely included in the NAICS code of 456 (health and personal care retailers). Retailers who specialize in selling smoked cannabis products are likely included in the NAICS code of 459991 (tobacco, electronic cigarette, and other smoking supplies retailers). And still other retailers might have picked another NAICS code that seemed to fit their particular situation.

Federally permitted cannabis businesses are likely already tracked in BEA's National Income and Product Accounts (NIPAs). To start out, federally permitted cannabis businesses are completely legal and therefore receive similar federal surveys as businesses in their broader industry categories. It is quite plausible that they fill out those surveys at the same rate as similar businesses and are therefore captured in either the 2022 Census of Agriculture, the 2022 Economic Census, or BEA's adjustments for underreporting and misreporting. Similarly, imports and exports of cannabis-related goods are likely captured in the U.S. Census Bureau's (Census') trade statistics. For simplicity, this paper assumes that current measures of GDP and GDI both capture all federally permitted cannabis in the aggregate statistics. This assumption implies that explicitly tracking federally permitted cannabis simply shifts output from one category to another without changing either GDP or GDI.

State-permitted cannabis businesses are likely already partially tracked in the current NIPAs. The 2022 Census of Agriculture focuses on hemp products that are legal under federal law and does not appear to include any information on cannabis that is illegal under federal law. For now, this paper assumes that those cannabis cultivators are excluded from measured farm output. If some of those cannabis cultivators are misreported as different farm businesses, then the increase to farm output calculated in this paper could be an upper bound. The 2022 Economic Census has a few specific products related to cannabis manufacturing, a general product related to smoked tobacco/cannabis retailing, and many general products which might include unsmoked cannabis retailing. Between 2017 and 2022, the reported revenue for NAICS 459991 rose from $9.4 billion to $31.3 billion. Over the same time period, the reported revenue for NAICS 459991 only rose 117 percent in the thirteen states with no legal cannabis sales in 2022. Furthermore, , the Annual Retail Trade Survey reports that revenue for the broader NAICS code "all other miscellaneous retailers" also rose 73 percent. Hence, it seems plausible that $11 to $15 billion [(31.3-9.4*2.17) to (31.3-9.4*1.73)] of the increase in reported revenue for NAICS 459991 was due to the inclusion of permitted cannabis retailers. Consistent with that hypothesis, a

[3]Purified chemicals are often used as an input to foods, beverages, tobacco, or pharmaceuticals. Hence, some manufactured cannabis products may be intermediate inputs rather than consumer products.

regression analysis finds a strong correlation between the state-level increase in NAICS 459991 with state-level estimates of permitted cannabis sales from the industry literature (Anne Holland Ventures 2022). However, both the aggregate statistics and the regression analysis suggest that less than half of state-permitted cannabis retailers are reporting their revenue in NAICS 459991. Information on the distribution of NAICS codes reported by the other state-permitted cannabis retailers was not located. For simplicity, this paper assumes that state-permitted cannabis manufacturers, wholesalers, and retailers fill out surveys at the same rate as similar businesses and are therefore captured in either the 2022 Economic Census or BEA's adjustments for underreporting and misreporting.[4] State-permitted cannabis businesses are forbidden from either importing or exporting their products—so their permitted activity is irrelevant to the Census' trade statistics.[5] Hence, explicitly tracking state-permitted cannabis mostly shifts output from one category to another without changing GDP much or GDI at all.

Finally, unpermitted cannabis businesses are likely excluded from the current NIPAs. These businesses are completely illegal and therefore do not receive federal surveys. One might think that BEA's existing adjustment for underreporting and misreporting in the broader economy (BEA 2019) implicitly includes these businesses. However, BEA's adjustment for underreporting and misreporting do not cover illegal market activity (IRS 2005). The only unpermitted businesses which might be tracked would be the small fraction of businesses which misreport their activity as legal (Soloveichik 2019). For simplicity, this paper assumes that neither unpermitted cannabis imports, unpermitted cannabis cultivation, unpermitted cannabis manufacturing, unpermitted cannabis wholesaling, nor unpermitted cannabis retailing are currently tracked in the current national accounts. Hence, explicitly tracking unpermitted cannabis raises measured output, measured GDP, and measured GDI.

[4] This assumption is very approximate. On the one hand, state-permitted cannabis businesses are less involved with the banking system and therefore do not receive ordinary paperwork that normal businesses use to fill out tax forms. On the other hand, state-permitted cannabis businesses may be more carefully monitored by regulators. The net impact of these two biases is theoretically ambiguous and is assumed to be zero for simplicity.

[5] Some state-permitted cannabis firms may buy from or sell to the unpermitted market. So, they could be involved with unpermitted imports or exports.

Table 1. Impact of Cannabis on Gross Domestic Product (GDP)

Current treatment in GDP	Adjusted GDP	Change to GDP
1. Federally permitted cannabis businesses are tracked in the farm, manufacturing, wholesale, and retail sector. 2. Neither state-permitted nor unpermitted cultivators are tracked in the farm sector. 3. State-permitted nonfarm businesses are tracked in their normal sector, but unpermitted businesses are not tracked anywhere. 4. Intermediate inputs to state-permitted cultivation and unpermitted manufacturing are tracked in consumption.	1. Federally permitted, state-permitted, and unpermitted cultivators are tracked in the farm sector. 2. Federally permitted, state-permitted, and unpermitted manufacturers are tracked in the manufacturing sector. 3. Federally permitted, state-permitted, and unpermitted wholesalers and retailers are tracked in the wholesale and retail sector. 4. Intermediate inputs to cultivation and manufacturing are excluded from consumption.	Increases by the value added from both state-permitted and unpermitted cultivators plus the value added from unpermitted manufacturers, wholesalers, and retailers.

Table 2. Impact of Cannabis on Gross Domestic Income (GDI)

Current treatment in GDI	Adjusted GDI	Change to GDI
1. Income earned by federally permitted cannabis businesses is fully tracked. 2. Income earned by state-permitted cultivators is tracked in the farm sector, but income earned by unpermitted cultivators is not tracked anywhere. 3. Income earned by state-permitted nonfarm businesses is tracked in their normal sector, but income earned by unpermitted cannabis businesses is not tracked anywhere.	1. Income earned by federally permitted, state-permitted, and unpermitted cultivators is tracked in the farm sector. 2. Income earned by federally permitted, state-permitted, and unpermitted nonfarm businesses is tracked in the normal sector.	Increases by the income earned by unpermitted cannabis cultivators, manufacturers, wholesalers, and retailers.

Table 3. Impact of Cannabis on Statistical Discrepancy (GDP-GDI)

Current treatment in Statistical Discrepancy	Adjusted Statistical Discrepancy	Change to Statistical Discrepancy
1. Federally permitted and state-permitted nonfarm cannabis businesses are fully tracked in GDP and GDI. 2. State-permitted cultivators are not tracked in GDP but are in GDI. 3. Unpermitted businesses aren't tracked in GDP or GDI.	All cannabis businesses will be fully tracked in both GDP and GDI.	Decreases by the income earned by state-permitted cultivators.

Table 4. Impact of Cannabis on Balance of Payments (BoP)

Current treatment in BoP	Adjusted BoP	Change to BoP
1. Federally permitted imports and exports are tracked together with other trade statistics. 2. State-permitted cannabis businesses do not have any imports or exports. 3. Neither unpermitted cannabis imports nor unpermitted cannabis exports are tracked.	1. All cannabis imports are included with other imports. 2. All cannabis exports are included with other exports.	1. Total imports increase by the value of unpermitted cannabis imports. 2. Total exports increase by the value of unpermitted cannabis exports.

2. Nominal Cannabis Statistics for the United States

Total personal consumption expenditures (PCE) by cannabis category

The paper starts out by estimating the consumption of federally permitted cannabis. This estimate is constructed using a commodity flow method. The U.S. Department of Agriculture (USDA) Hemp Survey reports that farmers earned $238 million from hemp crops in 2022. The Census' trade statistics report $75 million of hemp imports and $2 million of hemp exports in 2022.[6] Hence, the supply of federally permitted raw cannabis materials was $311 million in 2022. This paper then uses information from the state-permitted cannabis market to estimate manufacturing value added, wholesale markups, and retail markups. After those costs are added, this paper estimates PCE of $1.6 billion on federally permitted cannabis products in 2022.

Next, the paper estimates state-permitted cannabis consumption using data from the Annual Marijuana Business Factbook (Anne Holland Ventures 2013–2022).[7] These reports provide state-level estimates of both state-permitted medical cannabis back to 2011 and state-permitted recreational cannabis back to the industry's beginning in 2014. From 2005 to 2010, state-permitted medical cannabis sales were extrapolated using a news article on California medical marijuana sales in 2010 (McVey 2016) and counts of registered patients reported by the states of Michigan, Montana, and Oregon. Before 2005,

[6] These numbers exclude hemp fibers and textiles containing fibers because those fibers are not chemically active.

[7] BEA purchased full access to the Factbook until 2020 and was able to borrow a copy of the 2022 Factbook. Missing years are extrapolated and interpolated.

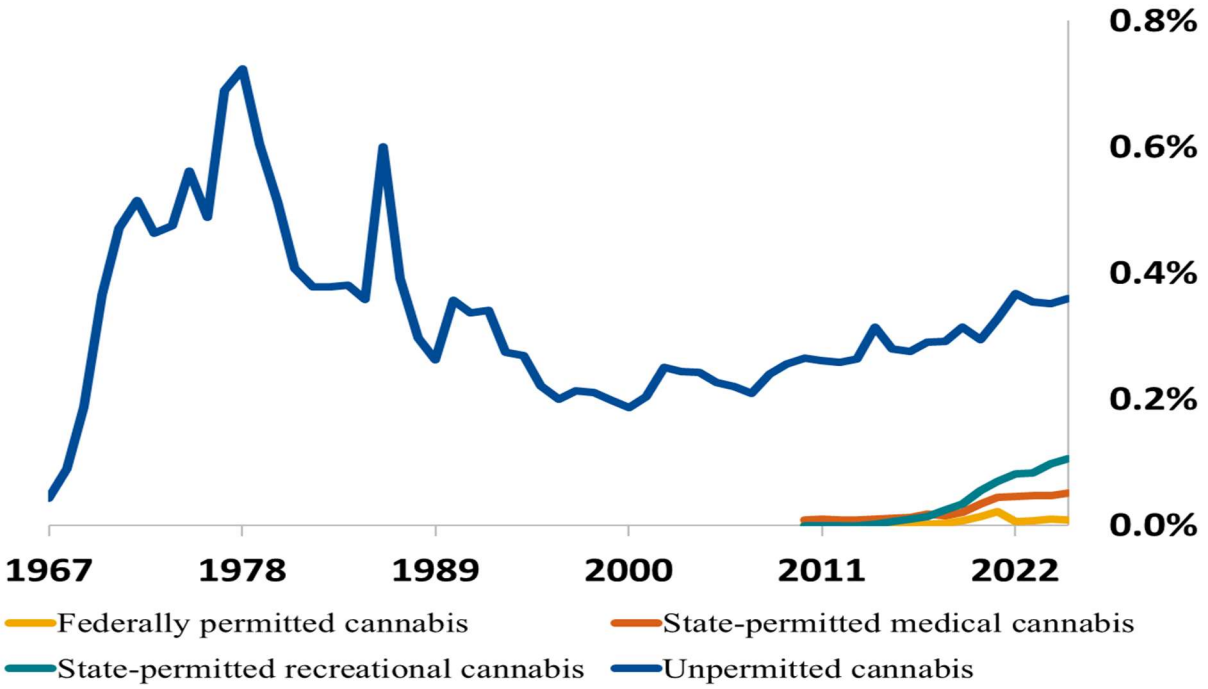
expert judgment was used to extrapolate state-permitted medical cannabis sales back to the industry's beginning in 1996 (Martin 2016).

Unpermitted cannabis is calculated simply as the difference between total cannabis consumption and permitted cannabis consumption. The primary dataset on cannabis consumption is the report, *What America's Users Spend on Illegal Drugs: 2006–2016* (Executive Office of the President 2019). Figure 5.4 gives the report's estimate of cash spending on marijuana. A separate section of the report suggests that non-cash transactions add another 12.5 percent to total spending. Accordingly, the cash spending numbers are then multiplied by 1.125 to get total cannabis consumption. This paper assumes that the report does not include federally permitted cannabis and therefore adds in spending on that category to get total cannabis consumption. For data between 1988 and 2006, expenditures are taken from table 72 of the report *National Drug Control Strategy: Data Supplement 2016* (Executive Office of the President 2016). For data after 2016, expenditures on cannabis are extrapolated from counts of the total number of people who used cannabis in the past year and an estimate of the number of days of usage per user in the past year[8] the National Survey of Drug Use and Health (NSDUH) (U.S. Department of Health and Human Services 2005–2025).[9] Information on spending per user day was not located, so this paper extrapolates spending per user day from BEA's published estimates of PCE per capita. Before 1988, expenditures on cannabis are extrapolated using nominal costs per gram, total cannabis users from the National Survey of Drug Abuse (U.S. Department of Health and Human Services 1995), and college survey data collected by Gallup (New York Times 1972).

[8] Some users report average days of usage per month or week in the past year. This paper converts those reports into days per year.

[9] The NSDUH data is not yet available for 2025. For now, growth in 2025 is assumed to equal last year's growth.

Chart 1. Nominal Cannabis PCE as a Share of GDP



Note: PCE stands for personal consumption expenditures and GDP stands for gross domestic product.

Chart 1 shows that permitted cannabis grew rapidly from $1 billion in 2010 to $39 billion in 2025, but it still accounts for only a small share of cannabis consumption. Even in states that permit both medical and recreational cannabis without restriction, unpermitted cannabis still generally accounts for the majority of consumption (Romero 2019).

There is no simple economic explanation for the dramatic growth in cannabis consumption in the late 1960s. A small portion of the increase might be explained by the large Baby Boom generation starting adolescence then—but consumption per teenager also rose dramatically in the late 1960s (Johnson and Gerstein 1998). Similarly, a portion of the nominal spending increase could be explained by higher costs per gram of cannabis—but real consumption was also rising. Instead, a cultural shift during the late 1960s is the most likely explanation for the dramatic growth in cannabis consumption. This cultural shift has been well discussed in popular, sociological, and legal literature. In addition, some economists have also studied it (Weisskopf, Bowls, and Gordon 1983).

In contrast, the spike in nominal cannabis consumption in 1986 is due to a short-term price spike. Contemporary news media noted the price spike and argued that it was caused by changes in drug enforcement behavior (Lindsey 1986). One might think that such a large spike in price would cause a drop in real consumption—but no such drop appears in a survey of 12th graders (Miech et al. 2019).

Apparently, cannabis consumption is relatively inelastic in the short term. The nominal consumption spike in the 1970s is harder to explain but may also have been caused by changes in the average cost per gram of cannabis (Ledbetter 1976).

Cannabis production by sector

This section begins by estimating retail margins for cannabis. Retail margins on domestically cultivated cannabis are taken from the paper, "Winning Big: Scale and Success in Retail" (Giroldo and Hollenbeck 2020). Table 3 of that paper reports that state-permitted cannabis retailers in Washington state typically charge retail prices approximately double wholesale prices.[10] The same approximate retail margin is also reported in a more recent analysis of several large cannabis companies (Harlow and Sherer 2023). This paper assumes that retail margins for both state-permitted and unpermitted cannabis are fixed at 50 percent of retail prices for all years and all states. The retail margins specified above only apply to consumer purchases. Manufacturers who buy unprocessed cannabis for intermediate usage are assumed not to pay retail margins.

Second, the paper splits permitted cannabis between unprocessed flowers and manufactured products. The primary dataset used in this paper draft is the ratio of flower sales to total cannabis sales in California's state-permitted market. That ratio is available online from 2020 onwards. Before 2020, the ratio is extrapolated with information from chart 3.09 of the *2020 Annual Marijuana Business Factbook* and chart 5.13 of the *2019 Annual Marijuana Business Factbook* as extrapolators (Anne Holland Ventures 2019 and 2020), a paper giving the market share for state-permitted manufactured products in Washington state (Kilmer et al. 2019), and the market share for manufactured products is extrapolated based on a sample of items which were seized and examined for chemical content (ElSohly 2020). For now, the paper does not split manufactured products by the exact product type, the likely industry of their manufacturer, or the category of permitted cannabis.

Third, the paper splits unpermitted cannabis between unprocessed flowers and manufactured products. Precise product sales information for the unpermitted sector was not located, but NSDUH does ask individuals what products were included in their last cannabis purchase. Hence, we can calculate a last purchase share for unprocessed flowers as: (share who report buying loose cannabis)/[(share who report buying loose cannabis) + (share who report buying pre-rolled joints) + (share who report buying

[10] This gross markup appears to conflict with the graphs shown in figure 1 of the same paper. The paper's authors were kind enough to explain that table 3 shows tax-exclusive prices and figure 1 shows tax-inclusive prices.

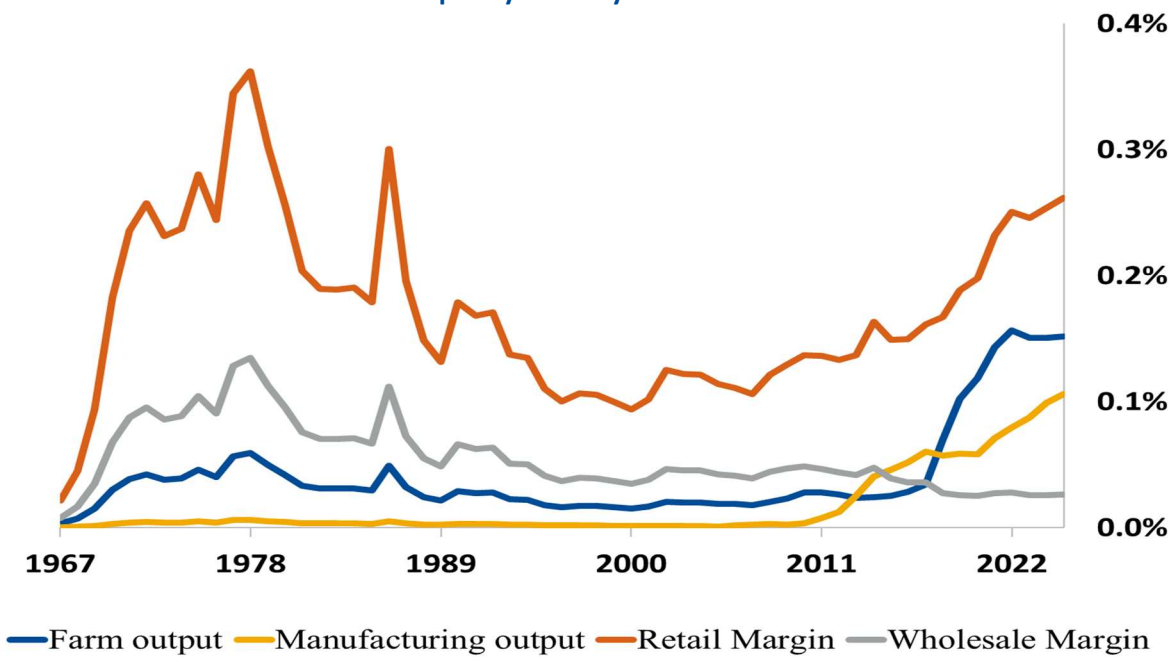
edibles) and so on]. Furthermore, the NSDUH also asks people whether they bought their last purchase at a store or dispensary. Accordingly, we can calculate separate last purchase shares for store purchases and other purchases. The ratio of those two separate last purchase shares can then be multiplied with the sales share for permitted purchases described in the previous paragraph to get an estimate of the likely sales share for unpermitted purchases.

Readers should note that surveys of cannabis usage, whether by the National Survey of Drug Use and Health or the International Cannabis Policy Study (Teutsch et al. 2024), suggest that the usage share for unprocessed flowers is noticeably lower than the sales shares for unprocessed flowers calculated in the previous paragraph.. These different results could be reconciled if some users are buying unprocessed flowers and then preparing processed products themselves. Like all other food preparation, this preparation of cannabis edibles is household production that is definitely out of scope for GDP (United Nations 2025, section 7.28). Similarly, joints rolled in the household could also be considered household production that is out of scope for GDP. Alternatively, the usage surveys could also be reconciled with the sales surveys if there are large differences in spending per user per product type. Because this paper focuses on the market sector, it will not rely on the usage surveys described in this paragraph.

Third, the paper splits the unprocessed flower supply between domestic cultivation and imports of wholesale cannabis. States with permitted cannabis typically require it to be cultivated and processed by licensed companies within the state (Shapiro 2019), so state-permitted cannabis is assumed to be entirely domestically cultivated. Estimating the split between domestic cultivation and imports for unpermitted cannabis is difficult. This paper's estimates of cannabis imports are calibrated to recent research studying import shares from 2008 to 2017 (Atkinson 2020). After 2017, the paper uses the ratio of cannabis seizures at ports to cannabis plant eradication to proxy for the ratio of imports to domestic cultivation (Customs and Border Patrol 2026 and Drug Enforcement Agency 2026). Before 2008, the paper assumes that the ratio of imports to domestic cultivation is fixed at its 2008 level of 4.6. The paper also assumes that a small but growing share of unpermitted cannabis is exported (Robinson et al. 2015).

Finally, the paper estimates wholesale margins for the unprocessed flowers that are either sold to retailers or to manufacturers for intermediate usage. The 2022 Economic Census does track cannabis wholesalers (NAICS 4245906), but it does not report wholesale margins for that narrow specialty. For now, this paper sets the wholesale margin for domestically cultivated flowers at 10 percent. This wholesale margin is based on the average wholesale margin for the broad industry NAICS 4245, as reported in the 2022 Annual Wholesale Trade Survey. This paper also sets the wholesale margin for imported flowers at 22 percent of retail prices. This wholesale margin is based on previous research (Soloveichik 2019) which found a total markup from import prices to retail prices of 72 percent.

Chart 2. Cannabis Output by Industry as a Share of Nominal GDP



Note: GDP stands for gross domestic product.

Chart 2 shows that cannabis output is large and growing. By industry, output in 2022 can be split into $27 billion of farm output, $25 billion of manufactured output, $6 billion of wholesale margin, and $55 billion of retail margin. By assumption, the retail sector always accounts for the largest share of cannabis supply. Chart 2 also shows that the contribution of manufacturing grew from almost nothing in 2010 to almost as large as retail in 2025. The cause for this rapid shift from unprocessed flowers to manufactured products is not clear. One explanation is that the invention of nicotine vaping devices might have encouraged cannabis vaping (Kowitt et al. 2019). Another possible explanation is that the growing social acceptability of cannabis enabled the development of better-quality manufactured products (Malochleb 2019). The rapidly increasing variety of sold cannabis products may be particularly relevant to users who are not comfortable with either smoking unprocessed flowers or preparing their own products.

Chart 2 also shows that domestic cultivation has grown much faster than total output. A portion of this growth can be directly attributed to the rapid growth of state-permitted cannabis, which is always cultivated domestically. But even unpermitted cannabis has experienced a shift towards domestic cultivation. One possible explanation for the growth is that the existence of state-permitted cannabis makes it easier to cultivate unpermitted cannabis domestically (Romero et al. 2018). Another possible explanation is that American consumers now demand high quality cannabis that cannot be produced

abroad (Robinson et al. 2015). Regardless of the reason why, the growth in domestic cultivation is large enough to noticeably impact overall farm output and therefore may be of interest to researchers studying the general farm sector.

Imports, Intermediate Inputs, and GDP

The increase in GDP from tracking cannabis is lower than either the consumption shown in figure 1 or the output shown in figure 2. Some cannabis is imported and therefore contributes to another country's GDP rather than the U.S. GDP. In addition, cannabis production requires intermediate inputs which must be subtracted from gross output to avoid double-counting. GDP measured by the expenditure side is equal to the consumption shown in figure 1 less imports and GDP measured by the industry side is equal to the output increase shown in figure 2 less intermediate inputs. This paper uses the same source data and assumptions to calculate the impact of cannabis on both measures of GDP, and so the impacts calculated are identical by assumption.

This section focuses on state-permitted cannabis cultivators and unpermitted cannabis businesses. As previously mentioned, the output of these businesses is not currently included in the NIPAs. So, it seems plausible that their intermediate inputs might also not be included. However, BEA uses a variety of sources to construct the supply-use tables and some of those sources may implicitly include intermediate inputs from businesses that do not report their output on government surveys. This is a topic for future research.

Cultivating cannabis indoors requires two main inputs: expensive space for the cannabis plants and electricity to power the lights (Caulkins 2010). In contrast, outdoor cultivation requires much less expensive space and far fewer lights. This paper's data on input costs is based on a survey of state-permitted cannabis growers reported in the *Annual Marijuana Business Factbook* (Anne Holland Ventures 2017). Chart 4.20 of that survey reports that indoor cultivation accounts for 92 percent of cultivation (combination growers are excluded). Chart 4.25 reports that space rental accounts for 15 percent of monthly operating expenses and utilities account for 25 percent of monthly operating expenses. And chart 4.34 reports a 25 percent profit margin for indoor growers. Hence this paper calculates a space rental share of 11 percent [15*(1-0.25)] and an average electricity rental share of 19 percent [25*(1-0.25)]. When calculating annual cost shares, this paper assumes a Cobb-Douglas production function so that cost shares are constant regardless of either output prices or input prices. A previous draft of the paper assumed a quasi-Leontief production function so that cost shares changed with wholesale cannabis prices, electricity prices, and housing prices. As a result of this revised

production function and other changes, the historical GDP revisions shown in this paper draft are not the same as the ones shown in the previous paper draft.

One might think that the growing legal acceptance of cannabis would increase outdoor cultivation and therefore reduce electricity usage. It is certainly true that the Drug Enforcement Agency's seizure statistics show a much higher ratio of plants eradicated per $ of output for outdoor cultivators than indoor cultivators. But most cultivators prefer indoor cultivation for nonlegal reasons like product quality (Byrne 2023). The same Drug Enforcement Agency seizure statistics used to estimate domestic production can also be used to estimate the share of domestic cannabis grown indoors from 2012 to 2024. That estimated indoor growing share appears to have grown slightly after 2017. Consistent with that extrapolation, an academic study found that legalization is associated with less illegal growing in national forests (Prestemon et al. 2019). Hence, electricity demand has grown slightly faster than domestic cannabis cultivation.

Manufacturing cannabis also requires two main inputs: unprocessed cannabis plant material and a space to hold the manufacturing equipment. Just like before, this paper's data on input costs is based on a survey of state-permitted cannabis manufacturers reported in the *Annual Marijuana Business Factbook* (Anne Holland Ventures 2017). Chart 4.14 reports cost of goods sold accounted for 25 percent of costs[11] and rent accounted for 14 percent. Chart 4.25 reports an average profit margin of 32 percent for cannabis product manufacturers. This paper assumes that unprocessed cannabis plants accounted for almost all of the cost of goods sold. Hence, this paper calculates an unprocessed plant material share of 17 percent and a space rental share of 10 percent. When calculating annual cost shares, the paper once again assumes a Cobb-Douglas production function and therefore constant cost shares.

In contrast to cannabis cultivators and manufacturers, cannabis wholesalers and retailers have few untracked intermediate inputs. Unpermitted cannabis wholesalers and retailers generally meet their customers in a public location or deliver their product (Bushey 2019), and so they do not have costs associated with a physical store. Therefore, it seems plausible that these businesses have negligible intermediate inputs. In addition, permitted wholesalers and retailers are already included in the retail sector and already have their intermediate inputs tracked in the supply and use tables. Hence, measured intermediate inputs in the national accounts will not change much when these businesses are tracked.

[11] This cost share is for manufacturers who do their processing in-house. Manufacturers who purchase extracts have a higher cost share which presumably reflects the labor and capital costs embedded in purchased extracts.

Chart 3. Imports and Previously Untracked Inputs to Cannabis Production as a Share of Nominal GDP

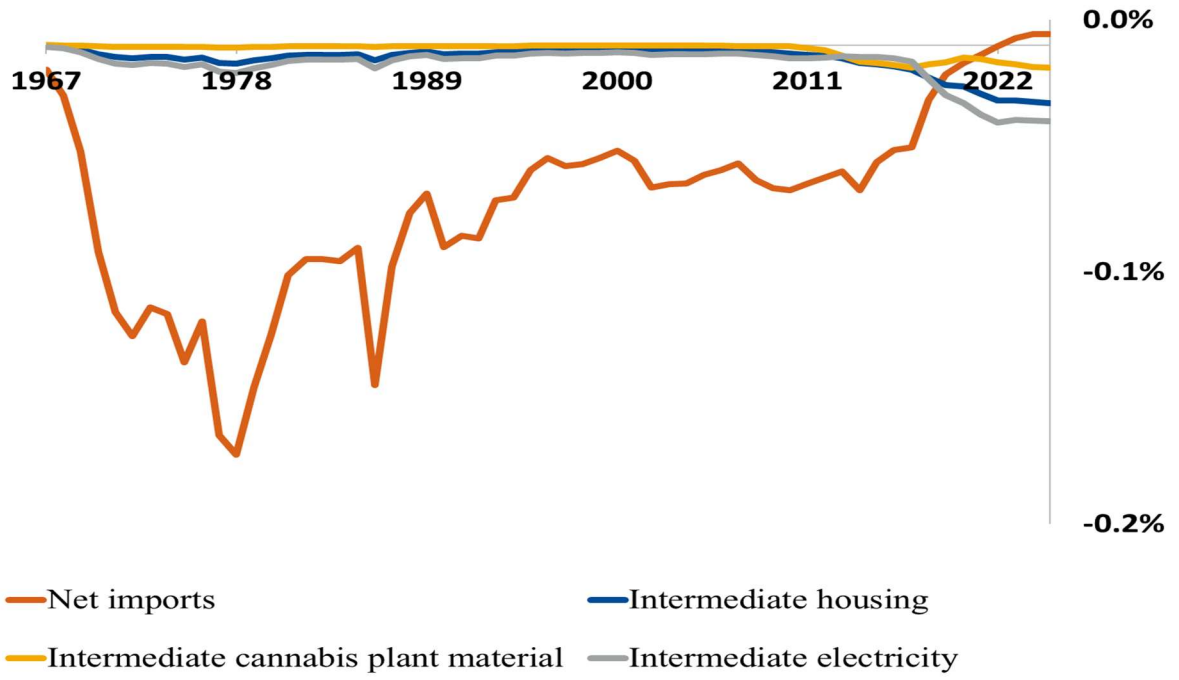
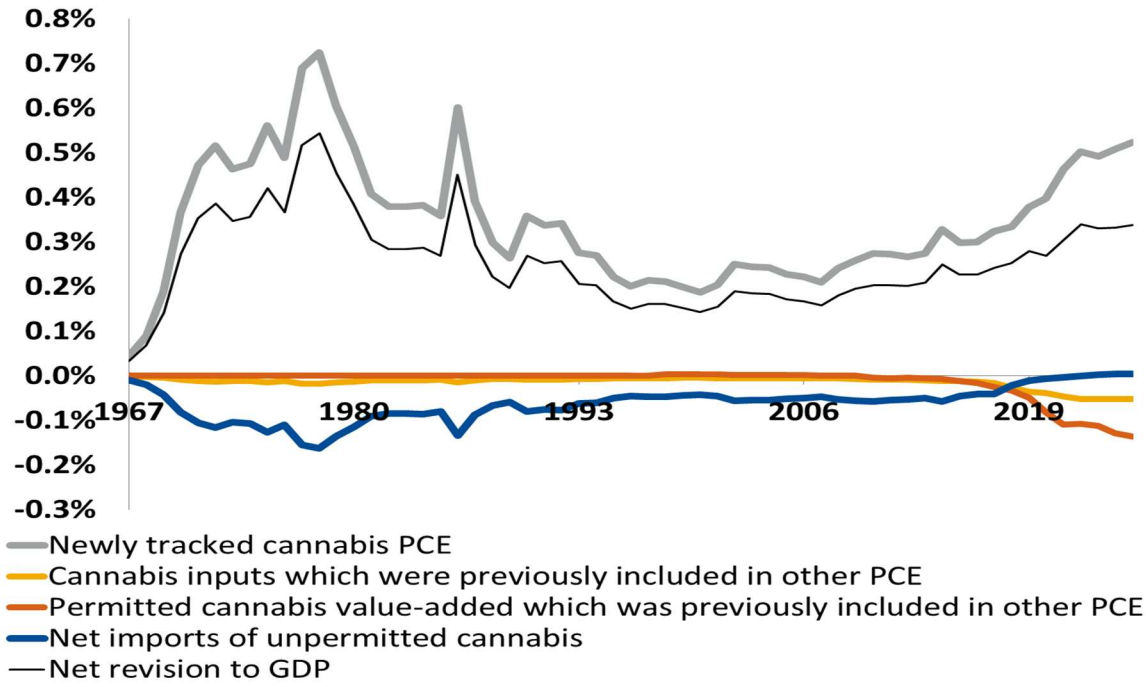


Chart 3 shows that net imports shrank rapidly after 2010 due to the growth in domestic cultivation. This import decrease is large relative to the cannabis industry but small relative to the overall trade statistics. As a result, aggregate trade statistics do not change noticeably when unpermitted cannabis imports are tracked. However, previous research has shown that other illegal drug imports have always been much larger than cannabis imports alone (Soloveichik 2019). If those other illegal drugs have also experienced a decline in net imports, then the measured trade statistics could change noticeably. This is a topic for future research.

Chart 4. Revisions to Nominal GDP from Tracking Cannabis



Note: PCE stands for personal consumption expenditures and GDP stands for gross domestic product.

Chart 4 shows that the level of nominal GDP increases when cannabis is tracked—but the level increase is less than total cannabis consumption. Historically, the largest offset to PCE was imports of unpermitted cannabis. But in recent years, the downward revision to other PCE from properly classifying permitted cannabis has also become important. By 2022, the increase in net imports was only $0.4 billion while the reduction in other PCE was $42 billion. In total, the $130 billion of cannabis consumption only raised the level of GDP by $88 billion in 2022. Much more research would be needed to determine exactly which commodity lines currently include permitted cannabis consumption.

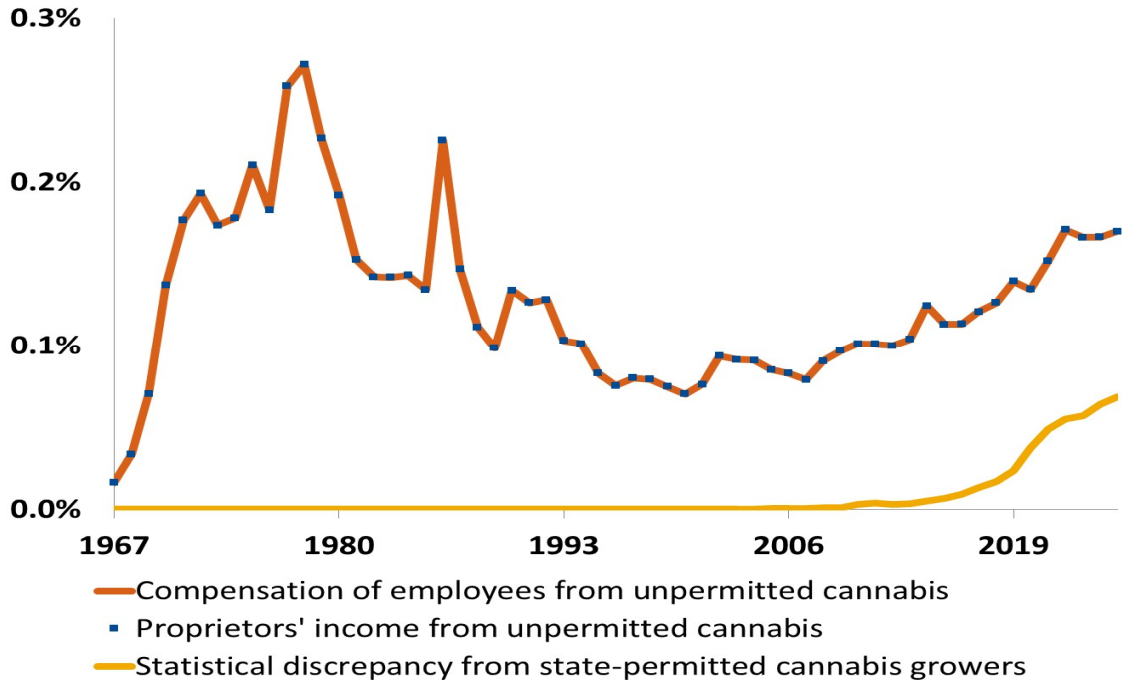
Income by Sector

As mentioned earlier, federally permitted and state-permitted cannabis firms are assumed to be already reporting their income to the Internal Revenue Service (IRS) and are therefore fully tracked in the GDI statistics. The only GDI impact of tracking state-permitted cannabis firms is that cultivators may not be tracked in GDP and therefore may contribute to the statistical discrepancy. So, this section primarily studies unpermitted cannabis businesses. It is not straightforward to split unpermitted cannabis value added between the GDI components. The major issue is that unpermitted cannabis firms are typically loosely organized and do not clearly distinguish between income categories. For now, this paper uses

survey data from the National Survey of Drug Use and Health to estimate the self-employment share. From 2022 onwards, that survey asked people whether they sold illicit cannabis. Before 2022, the survey instead asked people whether they sold illicit cannabis that they'd bought, grown, traded for, or been given for free. Between 2021 and 2022, the number of reported cannabis sellers more than doubled even though the number of arrests for cannabis sale only went up 12 percent. Those acquisition methods cover all the ways that people acquire ownership of a product, so it seems plausible that the doubling of reporting cannabis sellers comes from individuals selling products that they don't own themselves. Accordingly, this paper assumes that approximately half of cannabis sellers are employees and therefore split the income earned by unpermitted cannabis 50 percent to self-employed workers, 50 percent to employees, and nothing to taxes or capital compensation.[12]

In contrast to this paper, Europe generally assumes that proprietors' income accounts for 100 percent of illegal market value added employed (Eurostat 2018, 37). So, the increase to proprietors' income that will be shown in this paper could be seen as a lower bound.

Chart 5. Revision to Nominal Income from Tracking Cannabis, as a Share of GDP



Note GDP stands for gross domestic product.

[12] It may be true that unpermitted businesses do use some capital items like owner-occupied housing. But the NIPAs already have an imputation for owner-occupied housing which assigns their capital services entirely to PCE. Hence, tracking home office that are used for cannabis would implicitly double count them.

3. Cannabis Prices, Real GDP Growth, and Productivity Growth

The U.S. Bureau of Labor Statistics (BLS) standard methodology for calculating prices requires extremely detailed product information. Both the Consumer Price Index and the Producer Price Index generally track prices for the exact same product at a specific outlet over time (BLS 2018). And even when the exact same product cannot be tracked over time, BLS generally uses product characteristics to find a very close substitute. However, the consistent time series required for this standard methodology could not be located for either medical or recreational cannabis. Instead, this paper will use alternative methodologies to construct price indexes from the data located.

Retail Prices for Unprocessed Flowers

The paper starts out by calculating the retail cost per gram of unprocessed flowers. Since 2020, California has posted both average prices and total sales for the top 10 cannabis categories. Hence, a state-level chained average price index for the four flower categories can be easily calculated in near real-time. Between 2016 and 2020, the paper uses California prices for state-permitted flowers (Goldstein and Summer 2019) and a nationwide price index for state-permitted flowers published by BDS Analytics (Capelj 2020) as interpolators. Between 1981 and 2016, the paper uses average cost per gram from two government reports on illegal drugs (Executive Office of the President 2016 and 2019). And pre-1981 data are extrapolated from academic research tracking national cannabis prices between 1975 and 1980 (Lindgren and Grossman 2005), IRS data for national cannabis prices between 1973 and 1974 (IRS 1983), and a government report giving national cannabis prices in 1965 (Katzenbach 1967). By construction, this time series is an average price index and therefore implicitly includes outlet substitution (Reinsdorf 1998) as well as within-outlet price changes.

Next, unprocessed flower costs are adjusted for changes in potency. THC is the main psychoactive chemical in cannabis, and recreational users are often believed to adjust cannabis plant material consumption to hit a fixed THC target (Leung 2021). Consistent with this adjustment, the Drug Enforcement Agency reports prices for other illegal drugs adjusted for purity (Soloveichik 2019) and BLS consumer prices for generic drugs are per gram of active ingredient rather than per gram of pill (Bosworth et al. 2018). Annual statistics on the average THC share for cannabis are taken from the cannabis potency monitoring program (National Institute on Drug Abuse 2026; ElSohly 2020; ElSohly et al. 1984 and 2000). These statistics are then smoothed across five years and combined with the average

price per gram calculated earlier to derive a potency-adjusted price index. Potency data could not be located before 1972, so the paper assumes that THC content was stable from 1967 to 1972.

Readers should note that this price index does not adjust for either quality or availability. It is likely that quality for unprocessed cannabis flowers has risen in recent years. Most important, the new purchases of low-quality flowers by manufacturers probably means that the flowers remaining unprocessed tend to be higher quality than average. In addition, the general shift towards state-permitted cannabis has probably improved average quality somewhat.[13] Previous research also adjusted prices for changes in drug availability over time (Soloveichik 2019). This adjustment had little impact on unprocessed flower prices because they have been almost universally available for decades. However, some specialized manufactured products have become more available over time and so adjusting prices for availability might impact reduce their prices noticeably. Because quality and availability improvements are not captured, the reported price decline may understate the true reductions in adjusted prices.

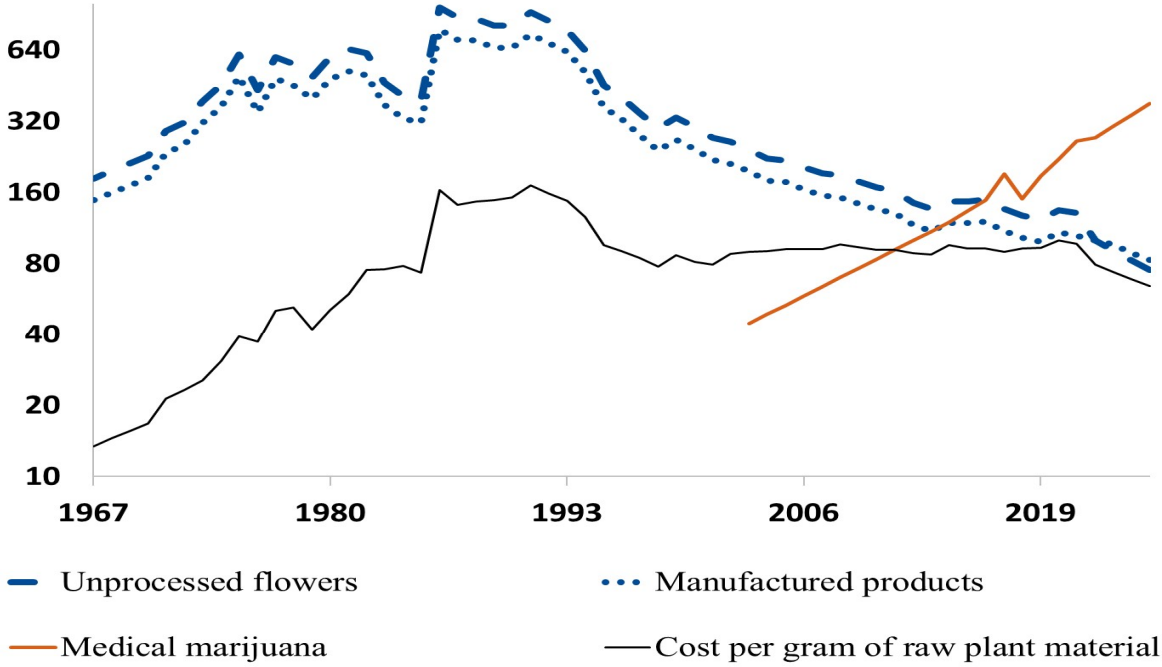
Manufactured cannabis prices

The manufactured cannabis category contains hundreds of products which differ by usage mechanism, THC and other chemical content, brand name, and other attributes (Caulkins et al. 2018). BLS standard methodology is almost certainly the best method of tracking price changes in a market with so much heterogeneity. But in the absence of a BLS price index, this paper calculates an average price index similar to the price index for unprocessed flowers. Recent manufactured product prices are calculated from California's posted average prices for seven types of manufactured products (vape cartridge by weight, vape cartridge by volume, edible by weight, pre-roll infused, extract by weight, and pre-roll flower). Consistent information on multiple manufactured products is not easily available before 2020. For now, this paper uses unprocessed flower prices as an extrapolator. A previous draft of this paper focused on cost per gram of THC concentrate (oil or wax) rather than studying manufactured product prices in general (Soloveichik 2021). That focus had the advantage of studying a commodity product with consistent potency and quality over time. But California data show that prices for this product have grown much slower than the overall manufactured product prices in recent years. The reason for this different inflation rate was not apparently obvious. Until the differences can be explained, this paper chooses to study a broader basket of products rather than focus on one homogenous commodity.

State-permitted medical cannabis prices

A previous draft of this paper constructed a special medical cannabis price index that was based on costs per patient. That price index is inspired by the cost indexes used to calculate BEA's health satellite account (Dunn et al. 2015), but it did not split spending by disease category like they do. However, this price index has become less relevant with the spread of legal recreational cannabis. Most medical cannabis patients live in states with legal recreational cannabis, and they have common conditions whose symptoms can be relieved with ordinary cannabis products (Sarris et al. 2020). Hence, some individuals do not bother to register with the state as medical cannabis patients and other individuals register but buy some of their cannabis in the recreational market. For the interest of readers, this paper uses academic articles to extrapolate the medical cannabis price index forward to 2025 (Boehnke et al. 2023) (Boehnke et al. 2024). But this paper does not use medical cannabis prices as a deflator when calculating real GDP.

Chart 6. Cannabis Prices, 2022 Base Year = 100



Revisions to Aggregate Indexes

Chart 7. Revision to GDP Prices from Tracking Cannabis

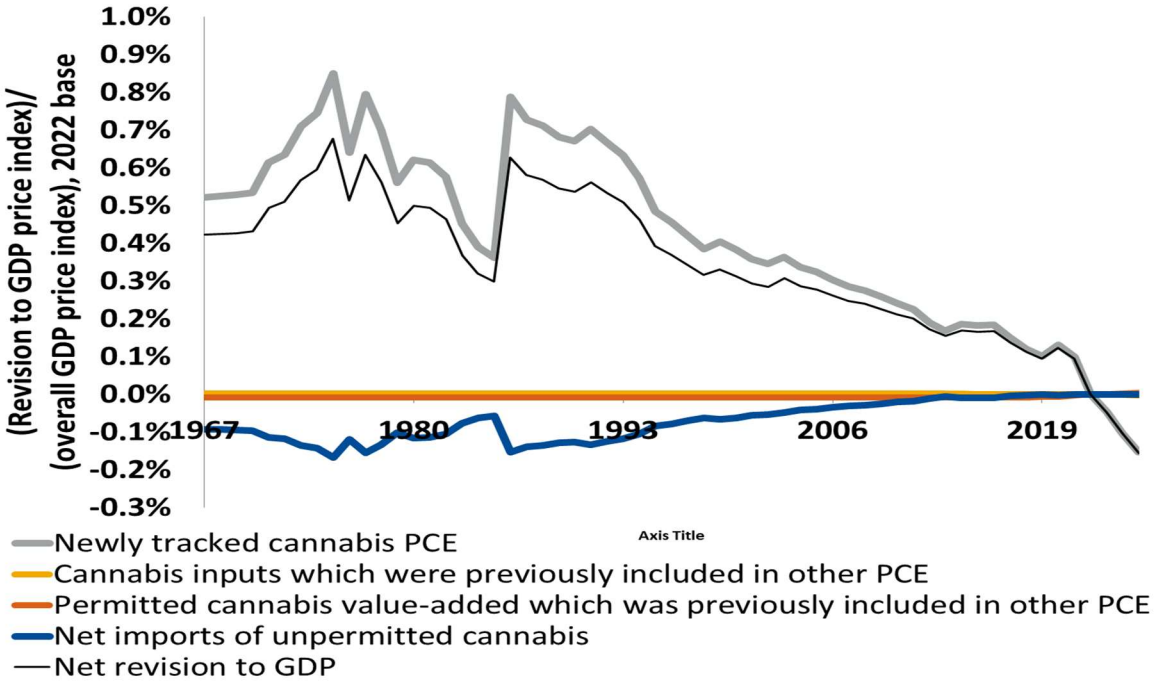


Chart 6 shows that cannabis prices have fallen steadily over the past decades. As a result of these falling prices, Chart 7 shows that measured inflation falls slightly when cannabis is included in the consumption basket. This revision to measured inflation is probably too small to impact aggregate monetary policy. But the price decline may be more economically significant to important population subgroups like young adults living in their parents' home.

Chart 6 also show that cannabis prices have risen much slower than the cost per gram of raw plant material. The main driver of this slower price growth is an increase in average plant THC content from approximately 1 percent in 1973 to nearly 16 percent in 2025. As a result, prices per THC unit in unprocessed flowers grew tenfold slower than prices per gram of cannabis. European countries typically base their cannabis price index on the cost per gram of plant material (European Monitoring Centre for Drugs and Drug Addiction 2012). Hence, different price trends between the United States and Europe may partially be explained by different measurement methodologies.

Readers should note that the revision associated with other PCE in Chart 7 is slightly sensitive to the price indexes assumed for those categories. For now, this paper assumes that rental rates for structures used to grow and manufacture cannabis track BEA's consumer price for housing services (table 2.4.4, line 50) and prices for electricity for cannabis cultivation tracks BEA's consumer price for electricity (table 2.4.4, line 58), import prices for unpermitted cannabis track unprocessed flower prices. This paper

also uses BEA's consumer price for other nondurable goods to deflate the state-permitted cannabis value added which had previously been misclassified as some other product (table 2.4.4, line 39).

Chart 8. Revision to GDP Quantities from Tracking Cannabis

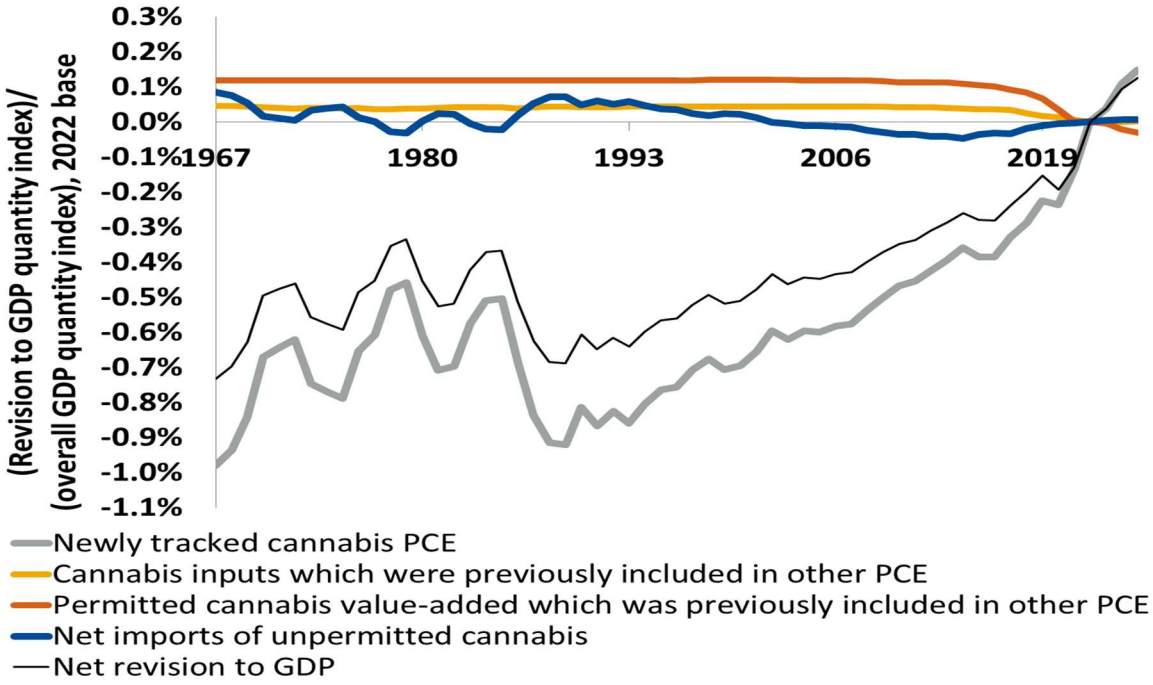


Chart 8 shows that tracking cannabis raises real GDP growth. Between 2010 and 2025, measured growth increases by 0.04 percentage point per year when cannabis is tracked in GDP. This growth increase is mostly driven by the newly tracked unpermitted cannabis, which accounted for almost all of cannabis spending until 2014 and still accounts for the majority of cannabis spending. But simply tracking permitted cannabis alone would increase measured growth between 2010 and 2025 by 0.02 percentage point per year. This upward growth revision from tracking permitted cannabis is partially canceled out by a downward revision to other PCE but the net impact of the two revisions is still positive because PCE cannabis prices have risen much slower than other PCE prices.

Total factor productivity accounts

This paper includes some initial estimates of how tracking cannabis might impact measured total factor productivity (TFP) but acknowledges that these initial estimates may be imperfect. The productivity calculations in this paper are based on a previous edition of the joint BEA/BLS Integrated Industry-Level Production Account (Garner et al. 2018) and extrapolated forward and backward using BEA's current

industry-level accounts and historical industry-level accounts. The precise TFP numbers presented in this section are somewhat sensitive to the TFP formulas used and the assumptions made. But the general trends shown hold for all reasonable assumptions.

Labor quantities for state-permitted cannabis are measured using an annual estimate of cannabis jobs (Anne Holland Ventures 2013–2020). That report gives estimates of the number of full-time workers back to 2016 and total workers back to 2012. After 2020, the number of cannabis jobs is extrapolated forward using published estimates of cannabis employment from Leafly (Barcott and Whitney 2022) and Vangst (Barcott and Whitney 2024). Before 2012, nominal revenue for the state-permitted cannabis market is used as a proxy for cannabis jobs before then. Data splitting recreational cannabis workers from medical cannabis workers could not be located. For simplicity, this paper will assume that wages are identical across the two categories of state-permitted cannabis.

Labor quantities for unpermitted cannabis are measured using self-reported selling from the National Survey of Drug Use and Health. Individuals who report both selling marijuana and selling illicit drugs are assumed to be employed in the unpermitted cannabis sector. Between 2021 and 2022, the survey questions on drug selling were changed and so there is a large trend break. Growth in 2021 is imputed using cannabis sales arrests from the Federal Bureau of Investigation's (FBI's) Uniform Crime Report (Department of Justice 1967–2025). Those same cannabis sales arrests are also used to extrapolate historical cannabis labor quantities before survey data is available. To be clear, individuals arrested for cannabis possession are assumed to be users rather than sellers and are therefore not included the labor quantity index. The paper assumes that arrests are split between foreign importers, domestic cultivators, domestic manufacturers, domestic wholesalers, and domestic retailers in proportion to their nominal value added. Readers should note that recent labor quantity growth may be biased if the amount of time each seller works has changed. In addition, historical labor quantity growth may be biased if the arrest rate for unpermitted cannabis workers changes over time.

Intermediate inputs are tracked using a variety of assumptions. As discussed earlier, the paper assumes that state-permitted cannabis manufacturing, wholesaling, and retailing are both tracked in the current production accounts. As a result, the only impact of tracking those industries is the introduction of more accurate price indexes for inputs and outputs. For unpermitted cannabis firms and state-permitted cannabis cultivators, the changes are more extensive. Cannabis cultivation requires electricity and space to hold the plants. Cannabis manufacturing requires unprocessed flowers and rental space to hold the manufacturing area. For simplicity, unpermitted cannabis businesses are assumed to own little capital and therefore the capital accounts will not be revised in this paper. Instead, intermediate inputs increase by the newly recognized electricity purchases, space rent, and unprocessed flower purchases.

Chart 9. Revision to Industry TFP Indexes from Tracking Only Permitted Cannabis

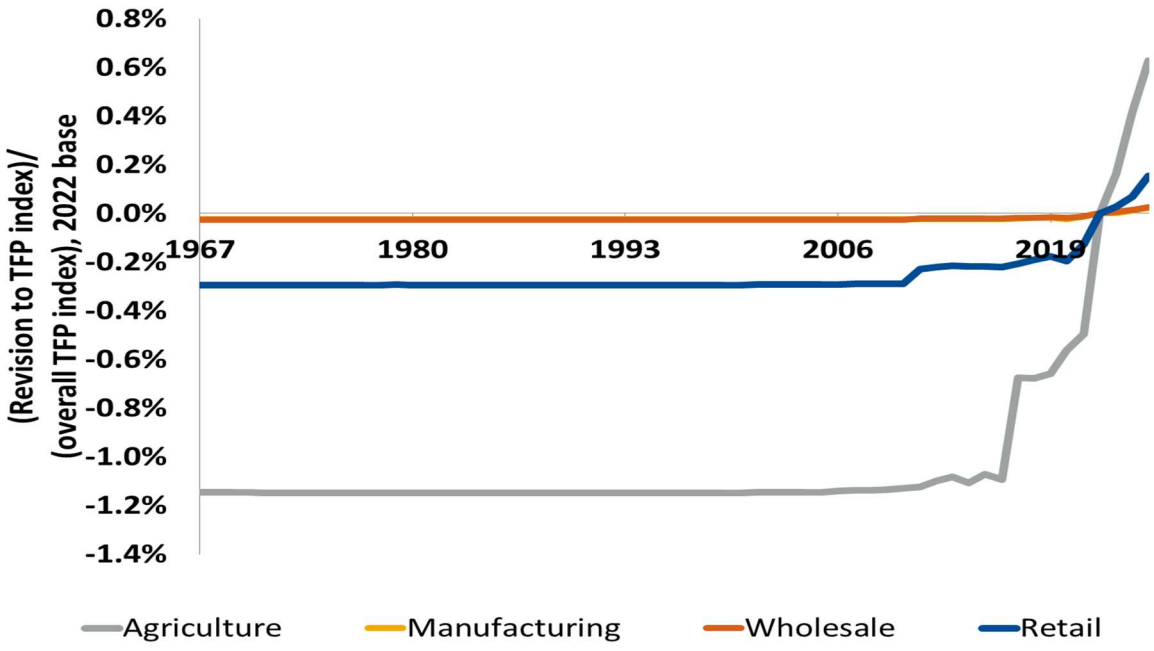


Chart 10. Revision to Industry TFP Indexes from Tracking All Cannabis

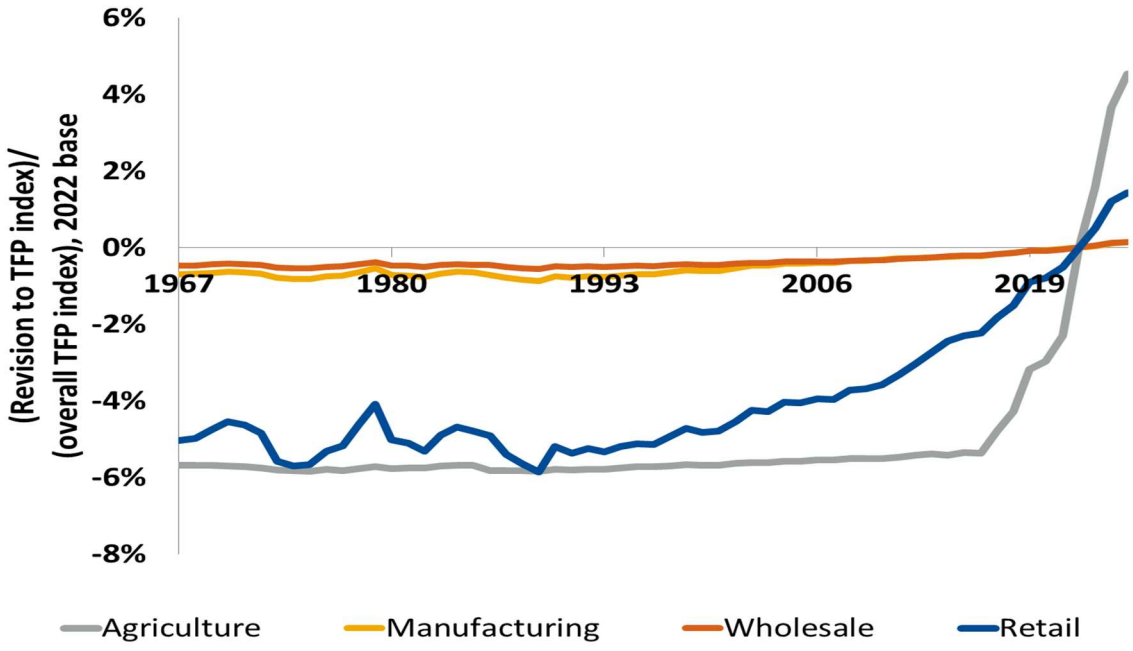


Chart 9 shows that tracking state-permitted cannabis between 2007 and 2024 raises measured agricultural productivity growth 0.10 percentage point per year and measured retail productivity growth

by 0.03 percentage point per year. These revisions are not trivial, but they are also not large enough to change aggregate productivity growth noticeably. Intuitively, the state-permitted cannabis sector is simply too small to dramatically impact the overall economy.

In contrast to chart 9, chart 10 shows that tracking all cannabis between 2007 and 2024 raises measured agricultural productivity growth by 0.74 percentage point per year and measured retail productivity growth by 0.33 percentage point per year. At first glance, these productivity revisions appear to large to be true. But a back-of-the-envelope calculation shows that they are plausible. Based on chart 2, this paper calculates that cannabis-related output accounted for 9 percent of the farm sector and 4 percent of the retail sector in 2022. And based on chart 6, this paper calculates that cannabis prices fell 4 percent per year between 2007 and 2024. Over that same time period, overall GDP prices rose 2 percent per year. If all other inputs and outputs were held constant, then we might expect that tracking cannabis would raise farm productivity by 0.54 percentage point per year [9 percent * (4 percent plus 2 percent)] and retail productivity by 0.24 percentage point per year [4 percent * (4 percent plus 2 percent)]. So, the TFP revisions shown in Chart 9 can mostly be explained by price declines.

Based on chart 10, this paper calculates that tracking all cannabis raises aggregate productivity growth between 2007 and 2024 by 0.035 percentage point per year. Over the same time period, BLS estimates an average productivity growth of 0.69 percentage point per year. In other words, tracking cannabis could raise measured productivity growth by 5 percent. However, this estimated productivity impact is somewhat sensitive to the assumed growth rate for the unpermitted cannabis workforce. This topic deserves more research.

4. Cannabis Consumption by State

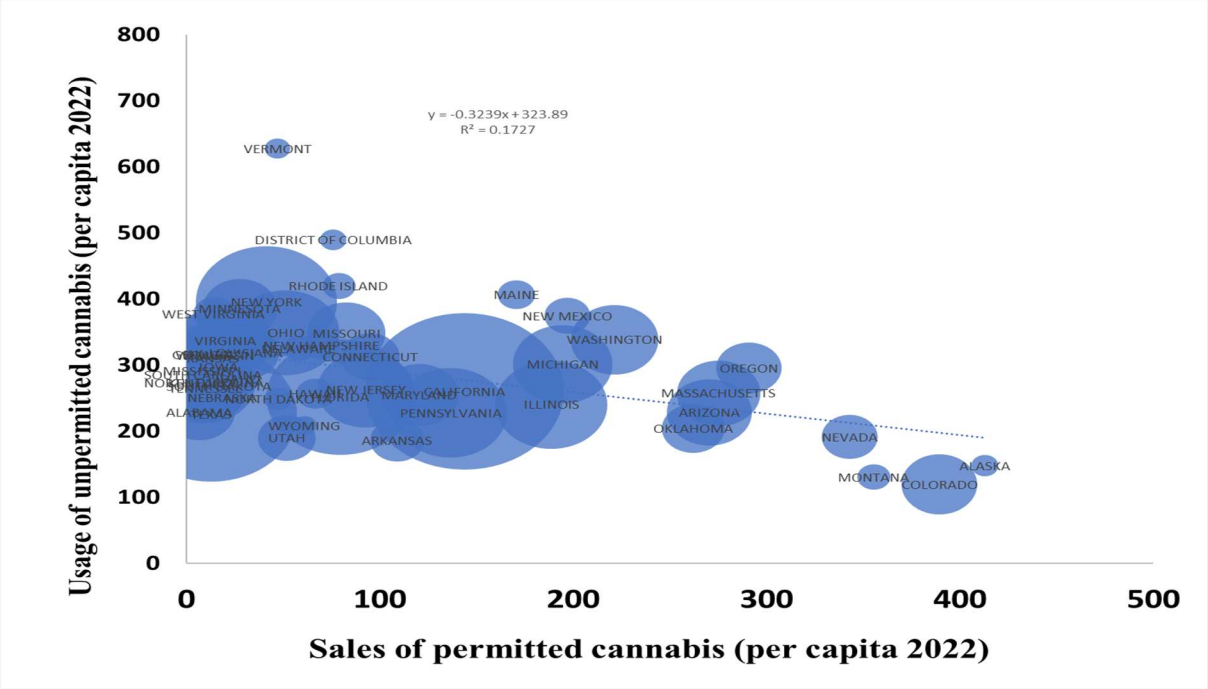
The primary dataset used to estimate total cannabis consumption is the National Survey of Drug Use and Health (U.S. Department of Health and Human Services 2005–2025). This paper focuses on the question “Have you used cannabis in the past month?” and assumes that all respondents who report using cannabis in the past month spent the same nominal amount on cannabis.[14] In other words, the elasticity of cannabis consumption for monthly users with respect to state-level prices is assumed to be

[14] This paper assumes minimal consumption by children under 12, who are excluded from the consumption survey.

exactly one. State-level survey data is available from 2003 to 2024. Before 2003, drug arrests in the FBI's Uniform Crime Report are used as a proxy for total cannabis consumption.[15]

Next, the paper estimates state-permitted cannabis sales. As mentioned earlier, the Economic Census records some retail sales of cannabis in the NAICS code 459991. So, information about state-level or even county-level cannabis sales could be inferred from the Economic Census. But estimates calculated from the Economic Census are more speculative than the estimates available in the industry literature. Accordingly, this paper uses estimates from the Annual Marijuana Factbook to get relative levels of state-permitted cannabis sales and then calibrates those estimates to the aggregate permitted cannabis (federal and state) reported in the earlier section.

Chart 10. Cannabis Consumption in 2022, Nominal $ Per Person



The most important result from Chart 10 is that unpermitted cannabis is widespread. Consumers in states with permitted recreational cannabis still consume considerable amounts of unpermitted cannabis. In those states, an unlicensed cannabis provider is similar to an unlicensed repairman: their business is not considered a serious crime even though it does not comply with all government

[15] The Uniform Crime Report does not disaggregate drug arrests by category and state. However, it does report regional data on the share of drug arrests for cannabis usage. That data is used in the historical extrapolations.

regulations or pay all taxes. Previous drafts of this paper have experimented with tracking tolerated unpermitted cannabis separately from unpermitted cannabis that is not tolerated. This split offered useful theoretical insights but was difficult to implement empirically. For now, the discussion in this paper will focus on the four categories of federally permitted cannabis, state-permitted medical cannabis, state-permitted recreational cannabis, and unpermitted cannabis.

The estimates in chart 10 are slightly sensitive to assumptions about local consumption of permitted cannabis by visitors nor data on transportation of state-permitted cannabis across state lines could be readily located. For now, this paper relies on a report by the Colorado Department of Revenue (Orens et al. 2018) which estimates that adult residents of Colorado consume 62.8 percent of the state-permitted cannabis sold in Colorado. This paper assumes that half of the remainder (18.7 percent) is consumed by nonresidents. BEA has summary statistics on cross-state purchases calculated from the Fiserv/Palantir data (Dunn and Gholizadeh 2020). That dataset's estimate of credit card spending in Colorado by non-Colorado residents was reasonably close to the 18.7 nonresident share of cannabis purchases, so the paper assumes that all cross-state purchases of state-permitted cannabis follow the same pattern as credit card payments. Unpermitted cannabis consumption is then estimated as the difference between total cannabis consumption and permitted cannabis consumption. But the qualitative results do not change much when those assumptions are revised.

Chart 10 shows a small negative correlation between per capita consumption of unpermitted cannabis and per capita consumption of state-permitted cannabis in 2022. However, this negative correlation is biased upward by the fact that states with higher historic levels of cannabis consumption were more likely to legalize it. When state-fixed effects are included, there is a sizable negative correlation between changes in per capita consumption of unpermitted cannabis and changes in per capita consumption of state-permitted cannabis. This sizable negative correlation is consistent with previous research that found a large decrease in illegal alcohol consumption after alcohol was legalized in 1933 (Soloveichik 2019). However, readers should note that an alternative version of chart 10 which looks at cannabis consumption in 2017 finds no correlation between unpermitted cannabis and permitted cannabis. The null result for 2017 is consistent with careful analysis of the impact of legalization on unpermitted cannabis prices in individual states (Perrault 2023). These different correlations have been explained by a theoretical model where legalization can be combined with different tax rates and different levels of enforcement against illegal sellers (Auriol et al. 2023). Accordingly, it is not possible to predict the future impact of either federal law changes or state law changes on the unpermitted market without more information on future tax rates or enforcement levels.

Conclusion

The official guidelines for national accounting recommend that illegal market activity be included in measured output (United Nations 2025). Consistent with that recommendation, most European Union countries have integrated illegal drugs and illegal prostitution into their national accounts (Eurostat 2018). BEA does not currently implement the recommendation because of challenges in source data (BEA 2019) and different conceptual traditions (Carson 1984). However, a recent executive order has recommended that cannabis be reclassified under federal law (Executive Order 14370 2025). In preparation for that possibility, this paper explores tracking cannabis might impact the U.S. National Economic Accounts through 2025. The results of this paper are exploratory only and subject to revisions from new data or changes in underlying assumptions.

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