Banking the Cannabis Industry: Current Challenges and Potential Solutions[1]

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1. Executive summary

The United States' legal cannabis industry has limited access to the nationwide financial network, resulting in heavy reliance on cash, which in turn has increased the incidence of crime and constrained the growth of businesses in the industry. In the absence of major legislative change, a private-sector solution to this problem must be found. We propose a solution with the potential to reduce cash holdings, increase sales, and open up state-level financial networks to cannabis businesses.

- Cannabis industry has experienced explosive growth over recent years as federal oversight has eased and state courts have passed industry-friendly legislation.

- Although it has gained legalization in several states since 2012, cannabis remains a Schedule I narcotic at the federal level.

- The extent of legalization and requirements varies greatly from state to state.

- Payment and banking access within the industry is severely restricted, causing heavy reliance on cash and therefore heightened susceptibility to crime and corruption.

- Closed-loop systems are centrally controlled (e.g. by the bank offering depository services to such businesses), facilitating oversight and considerably reducing frictions associated with ensuring transactions comply with applicable federal and state laws.

- Closed-loop systems operate within state boundaries, making it easier to maintain federal and state-level regulatory compliance.

- This model also bypasses the credit card network operating rules, which forbid cannabis related transactions.

- This model has the capability to mitigate the cannabis industry's cash issues and generate a substantial amount of revenue for those who operate as its servicers.

2. Introduction

Rapid growth under tight state and federal regulations has forced the United States cannabis industry to push the boundaries when it comes to utilizing the nation's financial network. Federally, marijuana is a Schedule I drug, but at the state level, cannabis can be legally bought and sold either medically, recreationally, or both, depending on the state. This complex legal status has limited the market's access to financial services at a time when the industry may need them most. Banks and payment processors are hesitant to offer their services for fear of prosecution or high costs, leaving the industry heavily reliant on cash and susceptible to substantial crime and corruption.

There is a very simple solution to this problem: Remove marjiuana from the Schedule I list. However, this solution is exceptionally unlikely in the foreseeable future and, therefore, more creative solutions must be pursued.

For several months, our group has poured over pages of research, legislation, and prospectuses for various proposed or implemented solutions that have surfaced over the years. Our conclusion is that the most promising solution is a closed-loop ACH system confined within state borders with potential for prepaid debit card integration. This system remains compliant with all federal and state regulations while staying true to its purpose of removing cash from the industry and facilitating the transfer of currency between associated parties. The following is a discussion of our findings regarding the industry, the regulations governing it, and support for our proposed solution.

3. Banking and Payment Basics

The current environment for banking and payment systems in the United States creates significant frictions for transactions between cannabis consumers and merchants. Because of these frictions, when a customer wants to use a credit card to purchase a marijuana product at a licensed dispensary, the payment method will likely be denied. To fully understand the restrictions on marijuana within payment systems, we start by thoroughly exploring the existing mechanisms and infrastructure for payments.

A “Simple” Card Transaction

Imagine you would like to purchase a cup of coffee. You swipe your card at a payment gateway (Square, Amazon Pay, Alipay, etc.) and wait for the word “approved” so you can receive your coffee and be on your way. The simplicity of this system has helped cards gain popularity around the world, especially among Gen Z.[7]

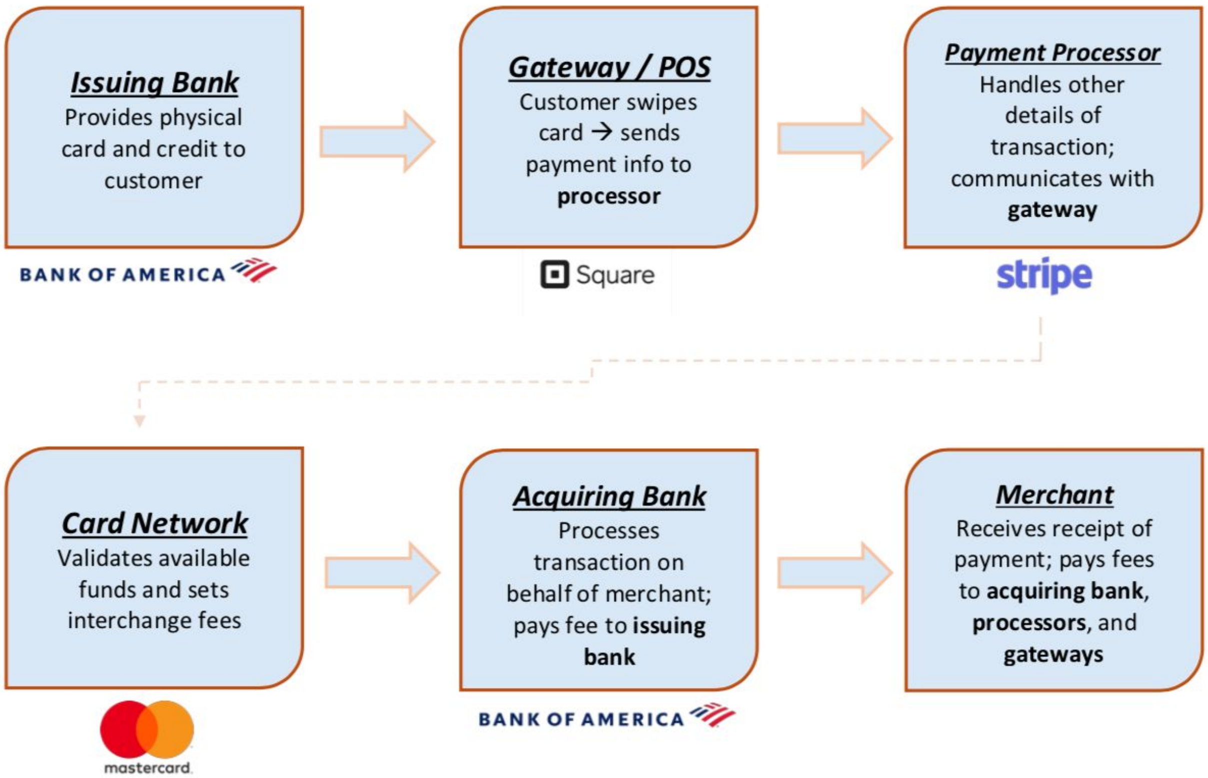
However, it is not as simple as it seems. While you wait for that “approved,” there is a complex process being run behind-the-scenes between the payment processor, a merchant service provider, your bank, and the merchant’s bank to ensure a secure, accurate, and replicable transaction between your account and the coffee shop’s account. This type of credit card transaction falls into the category of “traditional merchant services,” which utilize proprietary networks setup by ***Merchant Service Providers (MSPs)*** such as Visa, Mastercard, American Express. The process is as follows:

1. Once you swipe your card, the ***payment processor*** acts as a facilitator, forwarding the transaction information to the card network.
2. The ***card network*** takes the information and validates available funds with the issuing bank (usually the card-issuing bank) which then sends an authorization code back to the network if funds (debit or credit) are available for release.
3. Next, the payment processor is told whether funds are available (or unavailable) and sends a message back to the ***gateway***. If funds are available, you will now see “approved” on the gateway screen.
4. At the end of the day: The coffee shop manager will batch together the daily card transactions and send it to the ***acquirer bank or merchant acquirer***. The acquirer confirms this amount, takes a portion for themselves in fees, and deposits the funds in the merchant’s account.

Figure 1 highlights this process.

[7] According to a survey by Manole Capital (2019), card (both debit and credit) is the prefered payment option among 90% of Gen Z.

Figure 1: Processing a Credit Card Transaction



Merchant Acquirer vs Payment Processor

As evident from the description above, the payments ecosystem consists of many moving parts that can oftentimes seem redundant. One important distinction to make, especially in regards to how cannabis regulation applies to each, is between merchant acquirers and payment processors. The definitions of these two are often muddled due to the fact that the roles of each are occasionally carried out by the same entity. However, they compose two distinct pieces of the whole picture.

The payment processor (step 3 in **Figure 1**) plays a central role in a credit transaction, acting as mediator between the gateway and the financial institutions involved in the transaction. Once the customer swipes her card, the processor takes the information gathered from the gateway, relays it to the associated card network which, in turn, authorizes the funds with the issuing bank and relays them to the acquiring bank. In essence, the responsibility of the processor is to simply facilitate the transaction by providing the details of the transaction to the required parties – allowing for payment authorization, validation, clearance, and settlement. Thus, the role of the processor is often blended into multiple roles (i.e. steps 2, 3, and 4 shown in **Figure 1** may be consolidated) and they may provide additional services such as gateway assistance, compliance assistance, security solutions, or other value added services.

The “acquirer” or “merchant acquirer” or “acquiring bank” (step 5 in **Figure 1**) is simply the financial institution that manages and maintains the merchant’s account in order for the merchant to support debit and/or credit card transactions. The acquirer settles all card transactions on behalf of the merchant account.

Merchant Service Providers

Merchant Service Providers (MSPs) provide traditional merchant services to handle credit and debit transactions, whether in-store at a terminal or online. Think of them as the entity that connects merchants to both processors and financial institutions. Often, the MSP can act as the payment processor itself; which gives them tighter control on the mechanisms involved in the process and the fees charged to the merchant.

The more common MSPs include Square, PayPal, Fiserv, etc. – household names that appear on many pieces of swipeable plastic all over the world. These entities are vital in supporting the payment ecosystem within the US. However, as will be further discussed in the report, they have all publicly announced that their cards are not permitted for use within marijuana-related transactions. This has been the main cause of concern for MRBs hoping to attract customers with a card-enabled Point-of-Sale (POS). While the use of these cards is not technically illegal, the typical MSPs tend to shy away from providing services due to associated compliance costs.

When a credit card is used for a purchase, merchant codes are assigned to the transaction based on the category of product or service being purchased. These merchants codes, designated by the IRS, are for tax purposes. Since cannabis is illegal on the federal level, marijuana-related purchases do not have an assigned merchant code. Thus, the practice of miscoding is rampant, wherein these marijuana-transactions will be assigned a merchant code based on a completely different product category. While technically legal, the financial institutions backing the transaction must then file a ***Suspicious Activity Report (SAR)*** whenever miscoding (or any other shady practice) is flagged. Since the MSPs would like to remain in good standing with the banks, the major MSPs have all deemed their cards “not for use” for cannabis transactions.

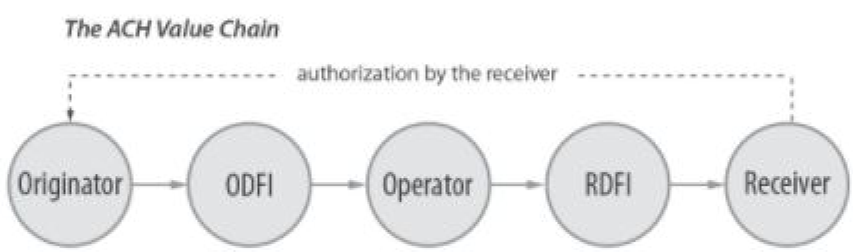
Fees

Fees are accrued each step of the process. The gateway provider takes fees for providing software/hardware for use, the payment processor takes fees for fraud screening and facilitation of transaction, the card network takes fees for purchase activity, and both the issuing and acquirer banks take fees for credit risk compensation, settlement, and ledger recordation. For a typical credit card transaction, there's a 2.5% fee being paid by the merchant split by the intermediaries (Fisher, 2017). A debit card transaction functions in a similar way except that the authorization and clearing process happen concurrently and risks are lower, so the fee is significantly lower. These fees are blended with the final price at checkout, increasing the cost for the consumer and reducing merchant margins.

Automated Clearing House (ACH)

An alternative payment channel to fee-charging card networks is through the Automated Clearing House system. The objective of the ACH system is to create a relatively frictionless electronic mechanism for financial transactions – generally domestic, low value payments. In contrast to a card network, an ACH acts as the clearing and settlement facility with which participating banks communicate in order to facilitate transactions from one account to another. The parties involved within the ACH value chain are illustrated in **Figure 2** below:

Figure 2: ACH transaction (Benson et al., 2017)



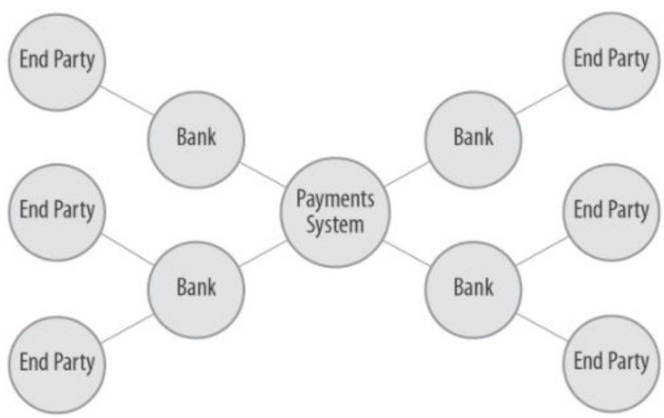
For example, when a customer purchases cannabis at a dispensary through a pull ACH transaction, the dispensary (originator) requests funds by sending the payment amount and its bank account number to the ODFI, which is normally the dispensary's bank. The ODFI then credits the dispensary account and forwards the transaction to the operator (ACH) which eventually reaches the RDFI (customers' bank). Finally, the RDFI debits the customer's account with the provided amount. A typical ACH transaction often settles within 2-3 business days (Benson et al., 2017).

ACH transactions are account-to-account payment, which doesn't require parties to go through the (fee-chargings) card networks. Thus, ACH payments are generally cheaper for both merchants and customers than the card system. However, ACH transactions are almost always final[8] and thus chargebacks are difficult, and more importantly, the risk of non-sufficient funds falls on the merchant. This risk is a central problem to overcome to apply ACH payment systems to the cannabis industry.

Closed- and Open-Loop Payment Systems

Payment systems can be further categorized as open-loop or closed-loop. Demonstrated in **Figure 3**, in an open-loop system, intermediaries (e.g. banks and credit unions) form relationships with the customers, and customers from different banks can transact with each other "without having direct relationship with each other's banks" (Benson et al., 2017). This model can scale quickly. However, it is governed by the network's rules, meaning the operating model is structured and not as adaptable to external changes.

Figure 3: Open-loop system (Benson et al., 2017)

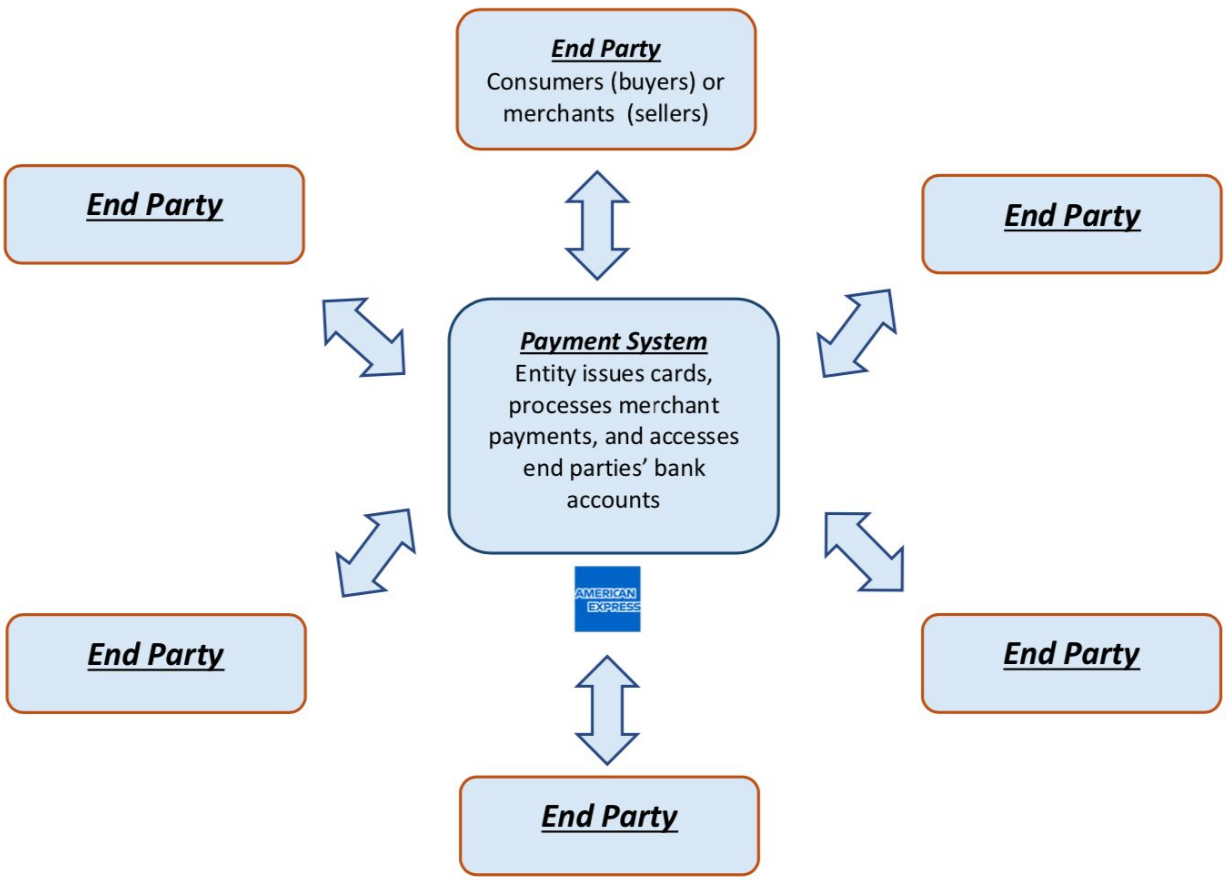


On the other hand, the closed-loop system doesn't require multiple intermediaries (**Figure 4**). All users have a direct relationship with one entity (normally the entity that set up the system).

[8] There are exceptions when the transaction is subsequently found to be unauthorized, revoked immediately, or when the transaction has an incorrect date or amount.

American Express or Paypal are examples of a closed-loop system. This system doesn't grow as quickly as open-loop because both parties have to join the system in order to transact. Nevertheless, the model is adaptable to new changes and is considered more suitable for the cannabis industry because the operating entity can specialize in and economize on necessary compliance activities. (As opposed to duplicated compliance activities conducted by intermediaries in an open-loop system.)

Figure 4: Closed-loop system



4. Payments and Banking in the Cannabis Industry Now

Federal Regulations

Federal regulation regarding the cannabis industry has been a topic of much debate for a number of years. There have been many proposals aimed at loosening the restrictions on the industry but little has been done regarding the ultimate roadblock: The designation of marijuana as a

Schedule I substance. As defined by the DEA, “Schedule I drugs, substances, or chemicals are defined as drugs with no currently accepted medical use and a high potential for abuse” (DEA, n.d.). As a result, marijuana production and distribution are strictly monitored at a federal and state level, and limited in many capacities throughout the United States, especially in regard to how the industry can access the country's financial services and capital markets.

At the federal level, the main guidelines for banking within the cannabis industry are those set by the Schedule I designation, the FinCen Bank Secrecy Act (“BSA”) expectations regarding marijuana-related businesses (“MRBs”), and, informally, the Cole Memo. Due to marijuana’s Schedule I listing, all distribution and sale of cannabis is technically illegal at a federal level, along with any activities that facilitate such transactions, including payment processing and banking. As such, banks and financial entities that operate in multiple states, such as Visa and Chase, refuse to process marijuana transactions or provide banking accounts to MRBs.

Businesses and banks operating exclusively within states that have relaxed restrictions on marijuana production, sale, and consumption must still satisfy BSA and Cole Memo guidelines. The BSA and Cole Memo work in conjunction to form a moderately comprehensive package of rules that govern the development of any state-level cannabis industry.

Within the Cole Memo, former Deputy Attorney General James Cole lists measures used to clarify and sanction legal MRBs in accordance with all federal laws but maintains that marijuana is a dangerous drug and has long been related to crime and violence (FinCen, 2014). As such, Cole notes that all law enforcement efforts and resources should be focused on the dangerous and violent side of the marijuana black market, and therefore allow the legal and safe production and distribution of marijuana to continue, within limits. This memo, in sum, shifted law enforcement priorities regarding marijuana, and relaxed enforcement for MRBs that did not infringe upon the listed guidelines regarding drug trafficking, distribution to minors, and violence, among other areas. Ultimately, the memo provided some distinction between federal and state rules that enabled banks to offer services to MRBs with confidence they were within legal limits.

Importantly, the Cole Memo had meaningful implications for banks that decide to interact with MRBs. “Within limits” is emphasized to include banks, as they must still adhere to strict requirements of FinCen guidance regarding the BSA and all its accompanying rules. For instance, all banks offering services within the industry must maintain compliance with all Cole

Memo guidelines as well as BSA rules concerning ***Anti-Money Laundering (AML)***[9] and ***Know Your Customer (KYC)***[10]. All financial institutions are also expected to file ***Suspicious Activity Reports (SARs)*** for any client that raises a red flag, which must be filed in accordance with federal law, irrespective of state-level laws.

To maintain compliance, a great deal of time, effort, and money must be put toward due diligence efforts to ensure the MRB is deriving revenue in a legal fashion and does not infringe upon any of the requirements listed in the Cole Memo[11]. Filing SARs and monitoring AML and KYC parameters for MRBs is a costly process for banks and other financial institutions, and has been a primary hurdle obstructing bank participation in the market. For those that do offer services, these costs have translated directly into high fees and interest rates on loans for MRBs.

State Regulations

At the state level, all states must be in compliance with the guidelines drafted by the federal government, but they are allowed to push forward their own legislation regarding the advancement of the cannabis industry within their borders, as mentioned above.

States have a great deal of power over the production and distribution of cannabis, which is why there is such a wide array of rules and regulations governing the various cannabis industries across the country. Listing off all the differing approaches would be time consuming and likely irrelevant considering the dynamic nature of the regulatory environment at the state level, so discussing and analyzing the trends may be a better use of space and time.

Today, many states are introducing industry-friendly legislation, albeit at a slow pace. Many had or have started with medical use or decriminalization measures and graduated or will graduate eventually to full legalization within state borders. However, marijuana remains, and will remain for the foreseeable future, a Schedule I drug at the federal level, making it difficult for banks to operate in the cannabis industry regardless of state laws. The Rohrabacher-Farr Amendment provided some relief to the medical marijuana industry by preventing the Justice Department from funding the prosecution of the state medical industry, but has not done enough to encourage banks to provide access to necessary capital and other financial services. This, and federal

[9] This rule is defined in FINRA, n.d.
[10] This rule is defined in Customer identification programs for banks, savings associations, credit unions, and certain non-Federally regulated banks, 2016).
[11] Requirements are listed in the Appendix.

oversight, has banks reluctant to partake in the development of the industry, even at the state level. The few who do are small banks that work within a single state and act as a closed-loop system to remain in compliance with the complex and interconnected web of federal and state regulations. However, state legislation is trending toward full legalization, and much of the state level action is putting pressure on federal regulators to take action regarding the easing of federal restrictions and even deschedulization.

A few promising policies and bills have been discussed in various branches at the state and federal level only to have been saddled with amendments or unrealistic alterations that have led to their demise. Two such acts are the SAFE Act and the MORE Act.

The Secure and Fair Enforcement Banking Act (or SAFE Act) was drafted to offer guidance for banks and shelter them from any wrongdoing while providing services to the cannabis industry (Senate - Banking, Housing, and Urban Affairs, 2017) . It also hoped to halt the discrimination of cannabis-related businesses by preventing bank regulators from recommending that depository institutions not offer their services to the industry. Further, it would also have allowed banks to continue offering their services to accounts they had previously believed were non-MRBs, but later found were MRBs, as long as they were legal and compliant. Overall, the Act protected banks from federal prosecution for banking MRBs as long as they remained within federal and state parameters.

The MORE Act, or the Marijuana Opportunity, Reinvestment, and Expungement Act, ultimately hopes to remove marijuana from the Schedule I substance list (Harris, 2019). This would federally decriminalize marijuana and allow states to decide its fate, much like how alcohol is controlled today.

Both of these bills would dramatically change the landscape of the US marijuana industry but will likely never see the light of day in their original form. Each has been bogged down by revisions from both parties and, as a result, have essentially been killed. Major legislative changes will likely be the cumulative result of multiple smaller bills, not cure-all bills like these.

Difficulties of Banking Cannabis

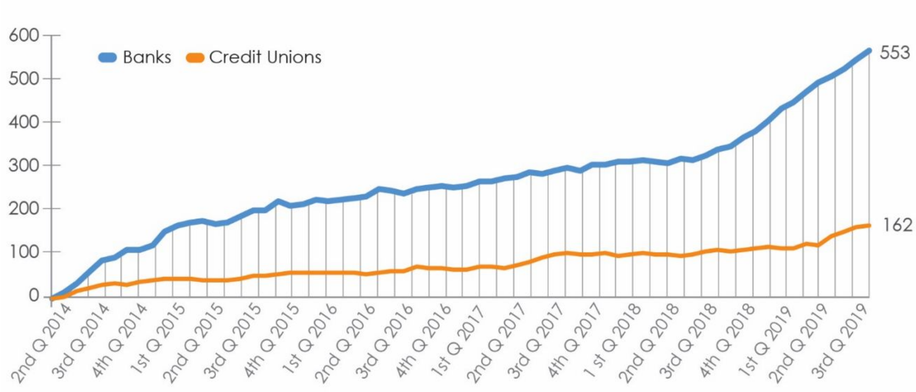
From the perspective of an MRB, finding a depository institution to take deposits or back a transaction related to the purchase or sale of marijuana or marijuana-related products is difficult and costly. Due to cannabis's classification as a Schedule I drug, most major MSPs (Visa, Mastercard, Amex) have publicly announced that their credit cards are not permitted to be used for the purchase of marijuana. Thus, the IRS has not registered a merchant code (an identifier used for tax purposes) for marijuana products – leading to practices such as shadow banking, miscoding, and account aggregation. These practices, when a bank identifies them, require the bank to file a SAR. These SARs cumulatively grow over time and drive up costs for banks.

Given the high cost of compliance, the restrictions on interstate banking, the reluctance of MSPs to enter the space, and the threat of federal government interference constantly looming, big banks do not yet appear interested in providing services or products for MRBs. The Cole Memo meant to provide some relief for business and banks to form relationships, but the aforementioned risks remain of paramount concern for the parties involved. In addition, most experts believe that the SAFE Act will not make it to the Senate floor for a vote. This act is meant to pave the way for more DIs, including large banks, to provide services to MRBs without fear of federal prosecution (Hawkins, 2020).

Nevertheless, there is a surprisingly large collection of regional banks and credit unions that have decided to provide services for MRBs within their state. Since Q2 2014 through Q3 2019, a total of 553 banks and 162 credit unions have entered into the MRB banking space, according to FinCEN data (**Figure 5**). As of December 31, 2019 The FDIC lists 8,515 insured or supervised depository institutions (FDIC, 2019); meaning 8.4% of US-registered depository institutions are dealing with the marijuana industry. This data highlights that for many regional banks, banking the cannabis industry provides lucrative rewards – whether fee-based or relationship focused.

While the risks involved in providing banking and payment services for the cannabis industry create undue obstacles for institutions, merchants, and consumers alike, they have also paved the way for some innovative alternatives to traditional banks and MSPs. From closed-loop systems to prepaid debit balances, we will later lay out potential solutions to the precedent risks.

Figure 5: Depository Institutions Providing Services to MRBs (FinCen, 2019)



Mastercard and Visa Stance on the Cannabis Industry

The majority of marijuana-related transactions are cash-based in the United States because major card networks and merchant service providers such as Visa and Mastercard do not allow marijuana-related transactions. As long as cannabis remains a Schedule I drug and is federally illegal, major card networks will continue to omit their services to the cannabis industry.[12]

However, companies have still found ways to use Visa and Mastercard's networks. When a purchase is made with a credit or debit card, merchant codes are assigned to each transaction. These codes are then used by the IRS for tax implications. However, since Visa and Mastercard do not support cannabis transactions, they have not issued cannabis merchant codes. This has led to the usage of merchant codes for a different product category such as tobacco or alcohol. This is not technically illegal as long as the product can legally be sold and purchased, and there is no intent to defraud the IRS by paying a lower tax rate (Brown, 2017).

Nevertheless, internal compliance teams within the major merchant service providers have deemed this to be a violation of their policies. This has and will continue to cause MRBs to be removed from the payment networks that Visa and Mastercard operate on. Without an MSP or card issuer allowing the transaction to process, an MRB is reduced to using cash for all transactions.

[12] According to Jeanette Volpi, head of North American communications, Visa strives to make their payment services consistent with federal and provincial laws (Moeser, 2018).

5. The Potential Benefits of Payment Solutions

There are several benefits for the industry that come with processing payments in the cannabis space. As mentioned earlier, MRBs are cash heavy and are vulnerable to crime. A 2015 analysis by the Wharton School of Business Public Policy Initiative found that, in the absence of being banked, half of cannabis dispensaries were robbed or burglarized—with the average thief walking away with anywhere between $20,000 to $50,000 in a single theft (RegTech Consulting, 2019). If payment processing occurred more in the space, there would be less cash on hand that is vulnerable to robberies, and as a consequence, robberies would likely fall.

Another benefit that comes from payment processing is the ability to curb black market activity. Black market participants are able to operate in the industry due to relaxed laws and enforcement. According to an audited report by the United Cannabis Business Association, there are 3,757 listings for dispensaries in California (Williams, 2019). This is a major red flag since there are only 873 cannabis sellers that are licensed by the state. With over three times as many illegal retailers than there are legal dispensaries, it is likely that many retailers are operating with tax, safety, and compliance practices that do not meet existing requirements. Payment processing, because of the value it produces for retailers through increased transactions, can help grey-market retailers absorb compliance costs and thus increase the fraction of the cannabis market operating within regulatory boundaries.

Additionally, payment and banking solutions for MRBs, to the extent they facilitate sales, will also thus accelerate firm growth, hiring, and tax revenues. While we are aware of no existing studies that estimate the potential impact of payment solutions on these dimensions for individual retailers, there are estimates of the effect of legalization on the industry as a whole.

The first is tax revenue. As most cannabis sales operate through an illicit market, they therefore pay no taxes. However in 2019, Colorado collected more than $302 million in taxes on marijuana sales on total sales of $1.7 billion (Colorado Government, 2020). This is only in Colorado and the number will only grow. According to a report from New Frontier, federally legal pot could generate an additional $105.6 billion in federal tax revenue by 2025 (Song, 2018).

Another benefit would be the increase in jobs and labor income. A study in Nevada estimates that legalizing recreational marijuana could support over 41,000 jobs till 2024 and generate over $1.7 billion in labor income (Restrepo, 2016).

While those impacts are larger than would be achieved via improved payments under the current legal environment, it is reasonable to expect that improved payments could achieve a non-negligible fraction of those gains, specifically relating to the labor market.

An Illustration of Possible Growth: The Case of CBD

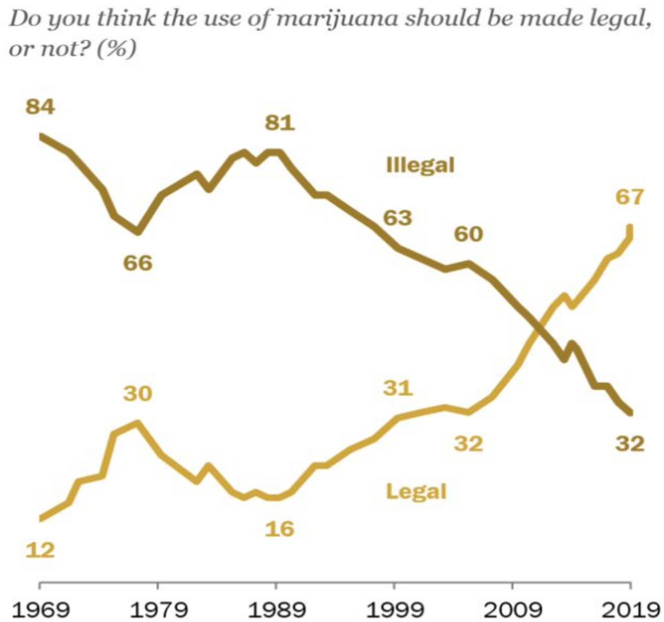
Marijuana contains two chemicals, THC and CBD, that produce the effects users experience. THC is the chemical compound that provides the psychoactive effects of consuming the plant, while CBD is known to have numerous medicinal properties without any psychoactive effects (Williams, 2019). The market for medical and recreational marijuana including THC is generally larger than the more niche demands for CBD.

Because of the difference in the chemical effects, CBD was legalized federally in the 2018 Farm Bill (Uzupis, 2020 and Abernethy, 2019).[13] Since then, CBD and hemp retailers have seen massive gains in consumer sales. Analysts predict that the CBD sales will grow by more than 3700% from 2018 to 2023 from $620M to $23.7B (Williams, 2019). This growth has also been facilitated via newly available banking and payment services because the updated legislation provided guidance on what activities merit a SAR.

Legalization of THC would arguably lead to a larger increase in sales than the CBD market experienced for three reasons. One, the baseline demand for THC is much higher. Two, the initial growth in CBD was “slow” because pre-Farm Bill, CBD products were underdeveloped and immature. Three, retailers responded with more caution for CBD than they likely would for THC, because the CBD change was in 2018 and public attitudes towards cannabis and hemp products have relaxed steadily since (see **Figure 6**, Daniller, 2019).

[13] As long as the CBD came from a hemp plant and not a cannabis plant also containing THC.

Figure 6: U.S. Public Opinion on Legalizing Marijuana (Daniller, 2019)



Banking Perspective

As it applies to MRBs, banks currently operate within a gray area between federal and state legislation. This regulatory landscape has resulted in weak banking relationships for MRBs and implies high risks for many large financial institutions to hold such accounts. However, there is still a dire need for banking by MRBs to avoid having large amounts of cash on hand. Institutions are finding that they can provide this service to the industry in need, but walk a very fine line to do so.

To open and maintain a bank account for a MRB, the bank spends significant time and resources ensuring that the business operates well-within the parameters and specifications of the Cole Memo. If a business's legitimacy is proved easily, the account should not merit a SAR report, but that is a risk the bank would then be taking on its own. As discussed in the Federal Regulations section, filing SAR reports are a costly process for the banks and this is always a risk while federal legislation remains stagnant.

Because this is such a unique and recent problem, banks have been very cautious to form relationships with MRBs. Prior to the Cole Memo, banks would take on immense liability to essentially provide depository services to MRBs. Without a playbook to follow, banks were shy to enter the legal-cannabis market at first.

Following the implementation of the Cole Memo and drafting of the SAFE Act, banks that work with MRBs still take on liability, but we are beginning to see clearer guidelines for maintaining a MRB account (Abrigo, 2016). Existing best practices focus on vetting MRB-type accounts and improving MRB-focused procedures for KYC and AML compliance. As a consequence, in recent years the challenge for banks has trended away from legally banking an MRB, and towards limiting the bank's exposure to the risk involved with taking on too many MRBs.

From a federal standpoint, the regulatory environment looks to be unchanging in the near future for sweeping cannabis legislation. With the likely failure of the SAFE Act, much of the obligation to provide banking opportunities for its legal businesses falls upon state legislatures to brainstorm and implement solutions that work for both the banks and the MRBs under the current federal statutes (Ricciardi, 2020).

6. Potential Solutions

In this section, we will propose a few solutions that have the potential to alleviate or solve the challenges faced by MRBs and their customers. However, it is important to note that for any of these potential solutions to be effective, the precondition of having an established bank account must be met.

Change in Traditional Merchant Providers

Although traditional merchant providers have publicly announced that they do not permit their services to be used in the cannabis industry, the situation is blurrier than it appears. Traditional Merchant Providers are continuing to use Visa and Mastercard's networks but with different merchant codes. This is not technically illegal as long as the product can legally be sold and purchased, and there is no intent to defraud the IRS by paying a lower tax rate. Card issuers and service providers operate in nearly every industry, but are weary of entering the cannabis space due to the absence of federal protection. If federal protection is granted to card issuers and service providers, we should expect to see the major players begin to make their presence known. However, a major change is not expected anytime soon. Therefore, we do not see Traditional Merchant Providers as a viable solution for processing the majority of payments in the cannabis industry.

Closed-Loop, Pay-As-You-Go

After assessing multiple business models across the cannabis payments industry, an ACH closed-loop system is the most common and viable solution. In an ACH closed-loop system, both users and businesses (dispensaries, growers, wholesalers, etc) sign up to join a private network that is subject to its own operating rules. Akin to Venmo and Paypal, users can take money out of their traditional bank accounts and put it in the closed-loop system.

Due to the private nature of the network, the controlling party can set the rules for involved parties. Compliance is key in the cannabis industry; thus, a closed-loop system allows the controlling party to monitor and ensure all transactions follow the law. Additionally, a closed-loop ACH system also bypasses the traditional payment networks (MasterCard and Visa).

From the risk management aspect, the majority of time, merchants can only join the system if they have accounts with corresponding banks. Consequently, during the vetting process, the bank can conduct a background check using their proprietary models and assess whether merchants are following the Cole Memo and Fincen guidelines. This not only increases transparency for the industry but it also allows banks to follow KYC and AML procedures. Users who wish to join the system would undergo Office of Foreign Assets Control (OFAC) checks and must have a valid bank account. Thus, the risk from the consumer side is shared by the consumers' banks.

With respect to transferring money between accounts, the ACH system bypasses the card networks. According to the white paper from Green Marimba, in the operating rules of the ACH system, "there is no mention of any liability incurred by transaction initiators for potential illegal activity conducted through the networks" (Brown, 2017). Thus, it's fair to assume that the liability for the cannabis transaction would be on the ODFI and RDFI.

There are already some players in this industry using this model, e.g., CanPay and Hypur. Those companies have a playbook focusing on being a compliant company that partners up with banks that want to establish a private network to serve the cannabis industry. This solution removes the problem of intentionally miscoding transaction types in traditional merchant services, allows better oversight than cash, and bypasses the card network problem found in the cashless ATM system (which we discuss shortly).

Closed-Loop Systems and MRB Banking-Relationships

The most salient friction in this market is the absence of banking options for MRBs. A closed-loop system that sets a high standard for compliance, in turn, makes it safer for banks to accept and bank MRBs. As such, a closed-loop system has the potential to solve the central issue–a lack of access to financial networks–and ultimately remove problematic cash held by MRBs.

Due to the legal complexity and immaturity of the cannabis market, banks have been hesitant to enter the space. However, depository banks and closed-loop systems would go hand in hand. As closed-loop systems are put into place, there will be less pressure on the liability arising from banking activity. Once depository accounts are available, closed-loop systems can provide the cannabis market with a feasible solution.

Value Generation for Closed-Loop Participants

A closed-loop system has the potential to generate value for MRBs, MRB customers, and bank partners.

For marijuana related businesses, the network's communication channels can potentially be leveraged to disseminate targeted marketing materials to produce further engagement with existing and potential customers. These same channels may also facilitate other forms of communication between businesses and their partners and customers that generate actionable market intelligence.

As for the customers themselves, they not only have a new way to communicate with the MRBs on the network, but also have the ability to transact without the use of cash. This is much safer and more convenient for all parties involved. In current closed-loop systems, customers have proven to be comfortable with paying a small per transaction fee for the safety and reliability associated with the system.

Banking partners will benefit by collecting transaction data and compliance fees; this should translate to the opening up of new avenues for revenue generation by entering the cannabis industry in a safe and efficient way. Furthermore, the closed-loop operator can collect and facilitate compliance at lower cost for banks via automation and scale, which we discuss further in the next section. Overall, if properly implemented, such a system can allow banks to capitalize on an industry that continues to expand with changing legislation.

Costs for Closed-Loop Participants

Implementing and building a closed loop system from scratch could be costly. Costs that financial institutions face can be divided into direct and indirect categories. The most important direct costs are compliance (collecting, compiling, and filing documentation), legal costs related to lawyers, and educational (training employees on MRB policies).

An estimated 10% of operating costs (noninterest expenses) for the large Tier 1 banks in the US is due to compliance-related measures. We estimate around 5% of noninterest expenses are due to compliance for smaller banks (near $10BB AUM). These costs arise mainly from training and record processing. Educating employees on compliance is a requirement of all depository institutions. However, training is free for all American Banking Association Members. The largest compliance cost arises from record processing, retention, and transmission (i.e. analyzing and sending compliance reports to regulatory agencies). This process often entails many individuals scouring over documents, looking for possible red flags and sending them to the proper agency. Artificial intelligence has aided tremendously in lowering these costs, but the issue of aggregating information from clients remains.

To determine just how costly these compliance measures are for a theoretical bank accepting deposits from MRBs, we looked at four deposit-accepting, FDIC-insured US banks with assets near $10BB in **Table 1**.[14] As we discuss in the next section, banks with AUM of less than $10BB are ideal for servicing MRB clients. In addition, banks with fewer assets may be more inclined to join the closed-loop system to increase deposit holdings. Due to disclosure requirements, banks slightly above the $10BB limit have more readily available data.

In **Table 1**, assuming 5% of noninterest expenses arise from compliance-related measures and that the theoretical bank in question holds 5% of total deposits in MRB funds, we estimate that currently, a bank with similar AUM would spend around $776,000 on cannabis-related compliance efforts per year.

[14] Asset and Noninterest Expense figures come from company public filings (SEC EDGAR).

Table 1: Initial MRB-Related Compliance Cost Estimate

Bank	*AUM*	*Noninterest Expense (NIE)*	*Total Compliance Cost (TCC)* †	*Est. MRB Compliance Cost* *
Capital Bank Financial	$ 10,000,000	$ 212,000	$ 10,600	$ 530
Eastern Bank	11,400,000	398,000	19,900	995
Banner Corp.	12,600,000	350,000	17,500	875
Home Bancshares	15,000,000	276,000	13,800	690
			Weighted Avg by AUM:	**$ 776**

In Thousands of USD
† Across all clients, assumes 5% of NIE
** Assumed MRBs are 5% of deposits*

However, this estimate implicitly assumes that the bank is implementing a compliance system from scratch, rather than on top of the bank's pre existing compliance software. To the extent that existing compliance procedures and systems are transferable to this space, no upfront expenditures are necessary. To illustrate the impact of this, we therefore adjust the final estimated compliance costs in **Table 2** to include cost savings of 10% – 25%. This wide range is due to differences in the quality of compliance systems; a bank with state-of-the-art software would achieve higher savings once implemented while a bank with mediocre software would achieve savings, but not as drastic.

Table 2: Corrected MRB-Related Compliance Cost

Size of Cost Savings	*Est. MRB Compliance Cost*
10%	$ 698,292
15%	$ 659,498
20%	$ 620,704
25%	$ 581,910

In Thousands of USD

In addition to non-duplication of existing compliance systems, these savings would largely come in the form of aggregation – meaning that the information of every transaction and persons involved in the transaction would be in one place, making it much simpler for either individuals or an automated system to analyze and compile compliance reports when necessary. With these savings, the total estimated cost of the Closed-Loop system would equate to roughly $580,000 – $700,000 per year. Please see the appendix for estimated savings under different assumptions.

Two additional factors can mitigate these direct costs. First, these costs are largely variable as they increment existing processes the banks already execute. To the extent that compliance processes are increasing returns to scale processes, these costs will decline as MRBs accounts become larger within a bank. Second, FIs that wish to participate in the marketplace could partner up with existing compliance/payment platforms to reduce the costs of technology and compliance management. For example, the operator of the closed-loop system could generate value and reduce bank costs by collecting documentation to pass on to the bank partner. Because of this, we expect cost savings on the variable cost component to increase over time as bank-operator partnerships improve and increasing returns to scale are realized with more MRB deposits.

The second category of costs FIs could face by taking on MRB clients are indirect costs. Indirect costs for the system include reputational hits and possible litigation costs. By engaging with MRBs, FI could lose businesses that do not approve such services. However, estimating the impact of these effects is extremely difficult and beyond the scope of this document. We would suggest case studies of early bank-adopters as the first avenue of investigation.

Closed-Loop, Prepaid Debit

An alternative solution includes using a prepaid debit card system. Prepaid debit cards essentially function as gift cards; a specified amount of funds are loaded onto the card, and that amount is then available to the cardholder for the purchase of goods. Usually, for cannabis-specific payments, these funds take 3-5 days to clear before consumers can use them. The card can either function within a closed-loop (e.g. for one specific retail store) or the funds may be made available for any card-accepting location (like a preloaded Visa gift card).

However, it is important to note that prepaid debit cards usually run on a large branded network, many of whom do not permit their platforms to be used for cannabis transactions. Thus, most MRBs that currently accept prepaid funds (whether on a card, app wallet, or otherwise) use a proprietary platform that will only work at that specific retail location or chain. This poses significant limitations for both sides of the transaction: Merchants lose potential customers who are unwilling to download a retailer-specific app and many consumers will be limited to only a handful of locations for their marijuana-related purchases. This has given rise to an assortment of regional companies and banks that support and accept pre-paid transactions on their respective platforms and books.

As of now, only smaller, regional players are taking a part in prepaid debit for the cannabis industry. This is largely due in part to the hesitancy of the large MSPs to process transactions for a Schedule I drug and the Durbin Amendment, which was passed in 2010 under the Dodd-Frank umbrella. The amendment reduced the size of interchange fees that could be charged by banks with more than $10 billion in assets under management (AUM).[15] Bank participation in this market was further reduced when the Federal Reserve took control and placed a maximum of 21 cents plus a proportional 5 BP of the transaction amount on interchange fees.[16]

Yet, opportunity still remains for smaller banks (under $10BB AUM) who retain the power to charge their own merchant rate. This size exception is an important factor in the decision of banks that have been offering prepaid debit services within their own states.

Cashless ATM

Although closed-loop systems and prepaid debit options offer the most complete long-term solutions under the current regulatory landscape, cashless ATMs were more popular before such options were widely and readily available. The cashless ATM provides a basic work-around for MRBs looking to extend multiple payment options to their respective customers.

Working as a way to provide debit transaction capability for customers, the cashless ATM logs cash debited from consumer accounts and returns a voucher valid only at the MRB housing the ATM. The customer essentially transfers the entire value of the voucher up-front as a cash payment to the MRB bank account and will generally receive cash as change if the entire voucher is not used. As such, cashless ATMs greatly reduce cash held by MRBs.

However, cashless ATMs have three large drawbacks that have reduced their adoption in the industry. First, cashless ATMs can only be used by MRBs with a bank account. Second, given the stance of MSPs, these ATMs only support debit card transactions and as such do not help consumers wishing to use credit. Third, even if the MRB has a bank account and a customer

[15] Specifically, interchange fees charged by banks must be "reasonable and proportional to the actual cost" of processing the transaction.
[16] This prompted a general shift for banks towards issuing credit cards to generate lucrative fees.

shows up without cash (and thus needs to use the ATM), a cashless-ATM at an MRB typically incurs the usual ATM fees by their banks plus additional "convenience fees" that compensate the MRB for set-up and ongoing fees charged by the payment processing provider. Given the extra convenience fee, consumers have incentive to use a regular, cash dispensing ATM elsewhere, reducing the effectiveness of the cashless ATM.

7. Remaining Challenges

Overall, the future of the cannabis industry is directly dependent on the passage of new federal legislation to free up operations currently limited by standing regulation. While federal policy will take time to change, interim guidances have made it clear that oversight of the new industry is the states' responsibility once they have voted to legalize cannabis. This means working within the framework of current federal regulations to allow the state-legal industries to flourish. The most pressing challenge for the industry remains; employing new and alternative payment solutions to work within unchanging federal policy.

Introduced above, some form of a closed-loop payment system is the most viable solution, but implementation of a closed-loop system on a state-wide level is yet to be successful. Some companies are beginning to provide services to their privately hosted closed-loop network, but given the investment required to establish such a system, the initial progress can be halting. States with a legal cannabis industry (like Nevada) have also struggled with implementing and managing such a large-scale service. It is unknown what form closed-loop solutions from states and local governments might take, but successful implementation of this solution at the state level appears unlikely until federal statutes change.

Rethinking and strategizing bills to remedy obstacles in the cannabis industry will be key in reshaping legislation. For those in the industry, the SAFE Act stood as a crucial, bipartisan bill that would have secured protection and offered guidance to banks dealing with MRBs. In short, the SAFE Act would pave the way for MRBs in operation legally, to have easy access to banking. But, in voting and amending the document to pass through the House, it now seems unlikely to pass through the Senate. Proposed legislation in the future will need to be more finely focused on loosening the limitations associated with operating in an industry that is both legal at the state level and illegal at the federal level.

The outlook for this industry is not negative however, as legalization of cannabis is the expectation of the authors of this report. It is unclear how long it will be until cannabis is descheduled, but the industry learned and incorporated valuable lessons after the legalization and popularization of CBD in 2018. Those lessons go beyond product characteristics[17] and include improvements in business operations and broader experience with financial services. The explosion in CBD business following legalization and improved financial access happened in a small and immature market. THC products are mature, in contrast, as cannabis has been sold at legal dispensaries across the U.S. for about 8 years now. Removing the frictions and legal restrictions on that market could unleash massive growth in the industry. If and when federal legislation reflects overwhelming recent public attitudes to legalize cannabis, MRBs and financial intermediaries best prepared to scale their business to a national level will enjoy the most immediate success from legalization.

8. Conclusion

As is evident from the above discussion, the cannabis industry has a long way to go before reaching its full potential as a market. Current rules and the lack of financial partners presents large frictions for business and economic growth in this industry that is not present in other industries.

The current regulatory regime, with inconsistent state and federal rules, will likely remain in place for years to come. This leaves open a window of opportunity for those willing to implement a closed-loop ACH system. As the cannabis industry continues to expand, its need for depository institutions and payment processors becomes increasingly urgent. This system has the potential to provide the market with both in one scalable and efficient package.

[17] As an underdeveloped market initially, firms spent substantial resources tailoring CBD products to consumer preferences. Now, CBD is even sold by big-name retailers.

Appendix

Cole Memo Requirements (Cole, 2013)

- *Prevent distribution of cannabis to minors*
- *Prevent cannabis revenue from funding criminal enterprises, gangs or cartels*
- *Prevent cannabis from moving out of states where it is legal*
- *Prevent use of state-legal cannabis sales as a cover for illegal activity*
- *Prevent violence and use of firearms in growing or distributing cannabis*
- *Prevent drugged driving or exacerbation of other adverse public health consequences associated with cannabis use*
- *Prevent growing cannabis on public lands*
- *Prevent cannabis possession or use on federal property*

Sensitivity Analysis of Estimated Closed-Loop Cost per Year

In the main report, we assume that, as a first pass, MRB-related compliance costs for banks are a fraction of total compliance costs (TCC) and this fraction is equal to the fraction of total deposits that are from MRBs, which set set at 5% under the assumption that MRBs will initially be relatively small portion of the customer base. We next assume that TCC is 5% of non-interest expenses (NIE). This gives an estimate of the cost of MRB-related compliance for a bank with near $10BB AUM.

In a second stage, we reduced that estimated cost by 10% – 25% to account for pre-existing compliance infrastructure, data aggregation savings, increasing returns to scale, and potential bank-operator partnership synergies. In Table 2, we estimated a range of $580,000 to $700,000 as the MRB-related compliance cost for a bank with roughly $10BB AUM.

Here, we examine the two key assumptions in the above estimation: How large compliance costs are as a fraction of NIE and the fraction of overall bank deposits coming from MRBs. We vary compliance costs from 2% up to 10%. 10% is the upper bound we found in bank disclosures for large banks, and smaller banks have lower compliance and regulatory requirements. We vary the percent of deposits from 1% to 5%, representing bankeld MRB assets of $100MM to $500MM. We repeat the calculations, exactly as in Table 1, apply a 10% savings, and report the findings below.

Sensitivity of Bank Compliance Costs for MRB Servicing†

	Implied MRB Deposits		Total Compliance Costs as % of Noninterest Expense				
			2%	4%	6%	8%	10%
	100,000	1.0%	$ 56	112	168	223	279
Percent of Deposits from MRBs	200,000	2.0%	112	223	335	447	559
	300,000	3.0%	168	335	503	670	838
	400,000	4.0%	223	447	670	894	1117
	500,000	5.0%	279	559	838	1117	1397

In Thousands of USD

† Assumes 10% Cost Savings

Glossary

MRB: Marijuana-Related Businesses

Any business that grows, produces, buys or sells or otherwise distributes marijuana, a business that leases real property or otherwise provides space to a Marijuana Business, or a business that leases or provides equipment which is directly used to grow or produce marijuana (Heartland Financial, 2017).

AML: Anti-Money Laundering

A set of laws, regulations, and procedures intended to prevent criminals from disguising illegally obtained funds as legitimate income.

KYC: Know Your Customer

A process that identifies a customer's known activities and identity to ensure compliance with AML and other regulations.

MSP: Merchant Service Provider

Merchant Service Providers (MSPs) provide traditional merchant services to handle credit and debit transactions, whether in-store at a terminal or online.

SAR: Suspicious Activity Report

A report made by a financial institution under the Bank Secrecy Act (BSA) of 1970 for monitoring suspicious activities that would not ordinarily be flagged under other reports (such as the currency transaction report).

ODFI: Originating Depository Financial Institution

Originating Depository Financial Institution or ODFI is a banking term in the United States used in connection with the ACH Network. In the ACH flow, the ODFI acts as the interface between the Federal Reserve or ACH network and the originator of the transaction (BSA/AML Manual, n.d.).

RDFI: Receiving Depository Financial Institution

Receiving Depository Financial Institution receives entries directly or indirectly from its ACH Operator for debit or credit to the accounts of its customers (BSA/AML Manual, n.d.).

FDIC: Federal Deposit Insurance Corporation

The Federal Deposit Insurance Corporation (FDIC) is an independent agency created by the Congress to maintain stability and public confidence in the nation's financial system by:

- *Insuring deposits*
- *Examining and supervising financial institutions for safety and soundness and consumer protection*
- *Making large and complex financial institutions resolvable*
- *Managing receiverships*

(Federal Deposit Insurance Corporation, 2019)

FinCen: Financial Crimes Enforcement Network

The Financial Crimes Enforcement Network is a bureau of the United States Department of the Treasury. They carry out its mission by receiving and maintaining financial transactions data; analyzing and disseminating that data for law enforcement purposes; and building global cooperation with counterpart organizations in other countries and with international bodies (FinCen, n.d.).

BSA E-Filing System

The BSA E-Filing system supports electronic filing of Bank Secrecy Act (BSA) forms (either individually or in batches) by a filing organization to the BSA database through a FinCen secure network. It also allows members of filing organizations to send and receive secure messages to and from FinCen (BSA E-Filing System, n.d.).

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Biographies

Student Biographies

Tucker Aglio is a senior at Lehigh studying Finance and Financial Technologies. He has held various roles in a number of University groups, including the Thompson Portfolio, Student Senate, and the Local Business Development Club. This past summer, Tucker interned as an equity research analyst at RMC Investments, a mid-sized investment management firm located in Hartford, Connecticut. Upon graduation, he will join CIT Group as an analyst on the healthcare leveraged finance team. In addition, Tucker has passed the CFA Exam Level I (December 2019) and intends on furthering his knowledge of the investment industry in the future.

Ha Dao is a senior at Lehigh University studying Finance and Business Information Systems. During summer 2018, he was part of Lehigh's first startup academy at the Nasdaq Entrepreneurial Center where he worked at Buzzboard to assess potential vertical expansion. In the summer of 2019, he continued his interest in startup environments at Stanford-StartX. At Lehigh, Ha is an executive member of the Investment group and a research assistant in the Marketing Department. After graduation, he will be a consultant for EY Financial Services.

Jacob Kaplan is a senior at Lehigh University studying Finance and minoring in Financial Technology and History. In the summer of 2018, Jacob followed his passion for history and worked as an intern for Congressman Tim Ryan. He spent the summer of 2019 interning for the Data Sourcing & Strategy team at Balyasny Asset Management, a global industry-leading investment management firm. Upon graduation, Jacob looks to begin his career in the broad industry of financial services with aspirations of moving more specifically into the FinTech space.

Griffin Middleton is a senior at Lehigh University studying Finance and Financial Technology with plans to start his career in the financial services industry upon graduation in May 2020. Griffin is a member of Lehigh's Dreyfus Portfolio and Alpha Tau Omega Leadership Fraternity, as well as the Treasurer of the Local Business Development Club. He has been a 4 time Dean's List designee and will be graduating with Honors.

Jordan Weintraub is a senior at Lehigh University studying Finance and Accounting with a minor in Computer Science. During the Summer of 2018, he gained international experience working as an analyst at Wood & Co, an emerging market investment bank. He also interned at American Express in their Tax Compliance department. In the summer of 2019, Jordan was an investment banking analyst at Stifel, a leading middle-market investment bank. Following graduation, Jordan will be interning as an investment banking analyst for ELLO Capital, a leading investment bank covering the cannabis industry. Jordan is a member of Lehigh's Dreyfus Portfolio, as well as the Tamid Fund and the Investment Management Group.

Faculty Advisor Biography

Donald Bowen joined the Perella Department of Finance at Lehigh University in 2019. His research focuses on corporate finance, with particular focus on the interplay between corporate investment, innovation, patent markets, venture capital, and IPOs. Professor Bowen's research has been published in *Management Science* and presented broadly, including the Western Finance Association, NBER, UBC Winter Finance, Finance Research Association (FRA), and Midwestern Finance Association.