California Cannabis Industry:

Market and Regulation Analysis

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Background and Thesis

Cannabis, commonly referred to as marijuana, was first federally regulated under the Marijuana Tax Act of 1937, then later banned by the implementation of the 1970 Controlled Substances Act. In 1997, cannabis was legalized for medical use in California, the first state in the U.S. to do so. Numerous other states followed suit with medical legalization with thirty six states currently having some sort of legal medical marijuana. However, the legalization of the recreational use of marijuana began much later, with Colorado and Washington becoming the first states to do so in 2012. Similar to the legalization of medical usage, many states have legalized or initiated the legalization of recreational marijuana use since 2012.

In the state of California, consumers ages twenty-one and older can enjoy marijuana recreationally and for medical purposes. Consumers in the market tend to choose their dispensary based on trustworthiness, location, available products, and price.[1] In 2020, California retail stores sold over $4.4 billion worth of cannabis products indicating almost 50% growth compared to 2019 and representing about 27 percent of legal sales in the United States.[2] Complementary goods for cannabis consist of all marijuana paraphernalia: rolling papers, bowls, vape batteries, and bongs. Market substitutes include CBD oils -- which will make someone relax but not under the influence -- and Alcohol -- another conventionally consumed depressant that will put someone under the influence. Producers in the market mostly consist of independent retailers but there are a few comercial/chain vendors. The market is notorious for its high level of taxation. The state of California made over $635 million in 2019 from taxes on the cannabis industry.[3] As a result of the costly taxes, the average price of legal marijuana products have increased. This

[1] Roy Bingham and Jessica Lukas, *BDS Analytics' Top Ten Cannabis Market Trends for 2019* (BDS Analytics 2019)

[2] "The World's Largest Cannabis Industry." *Cannabis Business Plan*, Jan. 2021

[3] Applied Development Economics. "Analysis of Cannabis Market in California and Case Study Cities." Applied Development Economics, Inc., 6 Aug. 2020

taxation happens primarily between cannabis growers and sellers. Due to the large transaction costs between them, it is likely that firms will try to horizontally and vertically integrate in hopes of avoiding those costs.

There are currently an estimated 5.9 million active recreational cannabis consumers in the California marijuana market[4]. The number of active consumers in the California market only includes those who are legally able to purchase marijuana, negating those under the age of 21 and those who purchase marijauana illegally through black market providers. Additionally, there is a large number of producing firms in the market, with 9,721 licenses, including 723 retailers, 281 microbusiness, 891 manufacturers, and 6,258 cultivators[5]. Additionally, there is no dominant firm in the market, with consumers purchasing products from firms based on preference. Due to the large number of consumers and producers with differentiated products, the California cannabis market is defined as monopolistically competitive. However, with the state of California requiring firms to acquire designated licenses, this acts as an entry barrier into the market, as firms need to have the capital to acquire licenses and pay the subsequent fees which can range from roughly \$5,000 to \$10,000[6]. California also uses a dual license structure in which there are additional local permits depending on where a firm is located. Firms have to first acquire a local license before they apply for state licensing, which can take up to eighteen months[7]. Moreover, With the introduction of proposition 64, the legal California cannabis industry has become highly regulated. The state of California has in place regulations associated with safety, testing, THC content, and transportation in order for firms to acquire a license and operate within the market. Although these regulations are mostly to ensure safety and quality of

[4] Jan Conway "Number of Cannabis Consumers by State U.S. 2018." *Statista*, 22 Oct. 2019
[5] "California Cannabis Market, Law, Size, Forecast." *Business Plan Templates*, 14 Mar. 2021
[6] Cohen, Gary. "How Much Does It Cost to Open a Cannabis Dispensary?" *Cova Dispensary Software*, 30 Apr. 2021
[7] "Get a Cannabis Permit in California." *Cannabis Permits*, 2019

products, the implementation of taxes on the cannabis market contributes to much of the price-raising economic regulation.

With the approval of proposition 64, the California state government has imposed taxes on all legal recreational cultivation, production, and sale of cannabis. The current tax rates in the California cannabis market are a statewide 15% excise tax of average market price and a cultivation tax ranging from $1.35 per ounce up to $9.65 per ounce depending on the form of the cannabis plant that is being sold -- fresh cannabis plant, cannabis leaves, and cannabis flower (the later being having the highest tax rate)[8]. Additionally, California has a state retail tax of 7.25%, along with an automatic local sales tax of up to 1%[9]. Local governments may also add additional sales taxes at their discretion. In combination, consumers may pay up to 25% in taxes for cannabis products.

Additionally, the passing of Proposition 64 resulted in many medical marijuana dispensaries going out of business. Legacy Cannabis farmers were obligated to comply with the new "set of jurisdictions, where rent and operational expenses increased due to the high demand," thereby stripping them of their first mover advantage and implicitly forcing them to raise their prices.[10] This, in combination with California's vast, popular illicit marijuana market, led consumers to turn away from the high-priced legal marijuana and consume the cheaper marijuna from the illicit market. Between 2017 and 2018, consumer spending in the legal marijuana market decreased by half a billion dollars. The cause of this phenomenon presumably came as a result of the price increase imposed by firms to fulfill the downstream taxation

[8] California Department of Tax and Fee Administration. *Business Taxes and Fees in California*, 2021.
[9] Levenson, Max Savage. "Marijuana Tax Rates: A State-by-State Guide." *Leafly*, 15 Mar. 2021.
[10] Irwin, Veronica. "Neglecting Legacy Cannabis Operators Is Costing California Billions a Year." *Mugglehead Magazine*, 19 Jan. 2021.

regulations while trying to sustain their previous margins.[11] However, since 2018, the legal Cannabis market has only seen positive growth in consumer spending as firms have adapted to the change in cost structure and leveraging scale economies.

With Proposition 64 establishing strong entry barriers in the market by increasing the costs of becoming a cannabis vendor, the cannabis industry in California should see a shifting market structure (from a monopolistically competitive towards oligopoly) in the foreseeable future. Given the nature of the state's license-based regulations and how they limit the extent of vertical integration, the system effectively enforces transaction costs that could be negatable with more efficiently-integrated firm structures, thereby resulting in higher prices for the consumer. As a result, consumers can seek out similar products from the illicit market for far cheaper than the legal market. The abundance of close substitutes offered in the illicit market in addition to the decriminalization of marjuana will see consumers in the general cannabis market become more price elastic (making them more willing to purchase their desired forms of cannabis illegally). We speculate that horizontal mergers will start to happen as each firm's margins decrease from lack of consumer interest, affording involved firms greater means of competing with the illicit market and negating the impact of fixed regulatory costs. However, the regulation in place which limits the extent of vertical integration will prohibit firms from reaching a maximally efficient level of integration and further the prices of the legal market from reaching the levels of the illicit market. Essentially, the regulation in place complicates the already competitive dynamic between legal and illicit cannabis markets forcing legal firms to compete on elements apart from price as a means of capturing larger market shares. We thus believe legal firms will also turn to

[11] Irwin. "Neglecting Legacy Cannabis Operators Is Costing California Billions a Year." *Mugglehead Magazine*, 19 Jan. 2021.

product differentiation as means of competing with the illicit market. By dealing in legally-sanctioned and tested products with higher variable costs like vapes and edibles, which are becoming increasingly popular and have reputations as commonly being fake and potentially dangerous within the illicit market, legal cannabis firms can target the health interests of consumers to capture larger market shares. Regardless, the market growth potential of the legal cannabis industry in California is severely limited by the impositions of the regulation currently in place.

Change in Market Structure

Currently, the cannabis industry in California has a monopolistically competitive structure. However, with the implementation of Proposition 64, a shift in market structure towards an oligopoly could be imminent. Entry barriers will form as a result of the clause in Proposition 64 that mandates all entrants to have already bought the property they intend to use as their storefront before starting the licensing process. With the licencing process taking anywhere between twelve and eighteen months, not to mention it’s own imposing fees, potential entrants could end up taking on as much as $100,000 in rent before getting their licence.[12] This large fixed cost disincentivizes potential entrants who are not willing or able to pay from entering the market, thereby creating an entry barrier.

Since the market consists mostly of a large number of independent retailers and there are new entry barriers that have been formed by Proposition 64, cannabis firms will start to horizontally merge in an attempt to lower costs and competition. Mergers amongst these firms would be approved since the market contains many firms, mitigating the potential risk of

[12] Irwin. “Neglecting Legacy Cannabis Operators Is Costing California Billions a Year.” *Mugglehead Magazine*, 19 Jan. 2021.

anticompetitive behavior arising in the market. The eighteen to thirty percent downstream taxation imposed by Proposition 64 provides additional costs for the legal cannabis vendors that illicit cannabis vendors do not have to incur. With illicit marijuana producers beating legal marijuana firms on price, regulated firms will look to horizontally integrate to lower their collective production costs. By lowering their costs through horizontally merging, firms in the legal marijuana market can lower their prices and better compete with illicit vendors. Even though firms in the illicit marijuana market will always have lower prices due to the lack of taxation, the quality of the products produced by the legal marijuana producers allows them to compete with the illicit producers. Horizontal integration in the California legal cannabis industry allows firms to lower their production costs, which, in solidarity with having greater quality products, improves the legal firms' ability to compete with illicit firms.

As an oligopoly, with restrictive regulation forcing high prices and low margins, firms in the legal cannabis market must resort to differentiating their products to escape Bertand's paradox. The convenience and health benefits of alternative cannabis products like vapes, edibles, and more, have driven the popularity of these derivative products to rival that of cannabis itself.[13] This trend implies innovations in cannabis consumption prove promising in terms of appealing to consumer interest and expanding the consumer base. Thus, investing in product differentiation will be a profitable means for firms to cater to consumer interest, suppress potentially deterring effects of their higher prices and capture larger market shares. Product differentiation is useful not only for competing within the legal market but against the illicit market, which is built upon in the conclusion.

[13] Adams, Tom, editor. *California: Lesson from the World's Largest Cannabis Market*. Arcview Market Research in partnership with BDS Analytics, 2019, 16-17

Regulation steers Consumers and Producers away from the Legal Market

A significant aspect of the cannabis industry, in California more so than other states, is governmental regulation. Due to cannabis's federal status as a Schedule I Substance, there is a conglomerate of federal, state, and municipal laws which regulate the cannabis industry in the name of public safety. In California, one of the most prominent forms of cannabis regulation is taxation. California imposes a tax on both the growth and sale of cannabis, which creates a sort of double marginalization in that the upstream (production) and downstream (sale) are priced up. Further federal regulations limit the financial opportunities for cannabis businesses which specifically adversely affects smaller firms. Ultimately these regulations serve to lower consumer interest and make it difficult for small businesses to enter or remain in the market.

These regulations have a drastic impact on the cannabis industry. First of all, firms have less incentive and ability to enter the market. For starters, conflicts between federal and state laws create a barrier between banks and firms. At the moment, financial institutions, including banks, which work with cannabis businesses face harsh penalties and can be in violation of anti-money laundering laws.[14] These laws require banks to take on expensive and burdensome practices such as inspecting cannabis businesses.[15] Because of this, few banks provide banking services to cannabis firms and few firms have access to banking services. This creates an intense entry barrier for potential entrant firms into the legal cannabis market as they are deprived of the capital and investment opportunities which are offered in other markets. Only firms who have immediate capital or access to high quality private investors can enter and survive in this market (large firms). One article stated "A lack of banking facilities has also hampered [merger and

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[14] Heinrich, Martin. "The National Cannabis Economy." *Senate.Gov*, Joint Economic Committee Democrats, Dec. 2018.
[15] Heinrich. "The National Cannabis Economy."

acquisition] efforts, such that much of the financing of mergers and acquisitions comes from private sources”.[16]

The case of this is clear in California’s “Emerald Triangle”, a nickname for a region in Northern California regarded as the capital of marijuana. Since the 1960s, and even through rigorous anti-drug campaigns by the government, the Emerald Triangle’s cannabis industry thrived and was characterized by many sellers.[17] Prior to legalization there were many producers in the Emerald Triangle who were able to sustain their businesses, however the costs of legalization, and specifically the regulation costs, were simply too much for the small, local firms to handle. When legalization and the regulations associated with it occurred, incumbent (illegal) firms in California were basically new entrants into the new legal market. Because many of these former incumbents did not have quality connections or much capital, they could not secure investments from financial institutions to successfully reenter into the legal market. Many well established farmers in the Emerald Triangle were forced to close their farms, get bought out by larger firms, or began selling in the black market again.[18]

Further regulations restrict the ability of cannabis firms to vertically integrate and become more efficient. Firstly, licensed based regulations require firms to obtain a license in each municipality of California they wish to sell in. Only roughly 30% of California's municipalities provide cannabis licenses and furthermore the process of acquiring a license is time consuming and costly.[19] This means that the legal market has a limited consumer base in comparison to the black market, which can sell anywhere illegally. Given the statewide decriminalization of cannabis and lower prices on the black market, consumers in non-licensing municipalities can

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[16] Wilson, Elser. “Cannabusiness in California.” *Lexology*, 13 Mar. 2019.
[17] Witt, Emily. “How Legalization Changed Humboldt County Marijuana.” *The New Yorker*, 20 May 2019.
[18] Witt. “How Legalization Changed Humboldt County Marijuana.”
[19] Elser. “Cannabusiness in California.”

buy and consume their marijuna with little incentive to switch to the legal market. Additionally for firms to vertically integrate, they must acquire a license for each step of the cannabis production/sale; however they can never have a license for testing laboratories. This is an expensive process as well, as each license costs a significant fee, based on profits or license type.[20] Only for larger firms with high consumer recognition and quality investments is the trade off of licensing and expanding the business's scope in exchange for increased costs profitable enough for the firm to stay in the market. The lack of vertical integration also lowers consumer interest in the cannabis market. Cannabis market experts claim the pros to vertical integration in this market include lower production costs, flexibility in production processes, faster response to consumer demand, and increased accuracy and quality control in goods.[21] All of these factors would make the legal cannabis market more efficient and increase consumer demand through better quality and cheaper goods.

Concluding on the Limitations of Regulation

The legal cannabis industry in the state of California will move towards oligopoly as a result of entry barriers created by the implementation of Proposition 64. Requiring potential entrants to take on the cost of their licencing process discourages them from entering the market. This, in addition to the industry containing a large number of firms, gives incumbents incentives to horizontally merge. In doing this, the cost of production between both firms in the merger and competition between legal competitors would decrease. Horizontal integration is important for legal vendors to take advantage of in order to better compete with illicit marijuana vendors.

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[20] Elser. "Cannabusiness in California." *Lexology*, 13 Mar. 2019.
[21] King, Mike. "Cannabis Vertical Integration Pros and Cons." *Vangst*, 8 Apr. 2021.

Firms in the legal market can never beat illicit marijuana vendors in price because legal vendors have higher marginal costs due to regulation imposed by Proposition 64. However, since legal marijuana products are higher in quality, by utilizing specific product differentiation to appeal to previously illicit consumers and horizontal integration, the newly lower difference in price between legal and illicit marijuana allows legal marijuana firms to better compete with illicit marijuana vendors. Even so, the limitation of vertical integration ultimately complicates the industry's expansion in the future, contributing to California cannabis regulations' broader negative influence on total surplus.

California legislation does not explicitly prohibit vertical integration so much as it sets its implicit fixed costs egregiously high. It comes down to the licensure regulation for each facet of the cannabis industry in that separate licensing is required for each step of the supply chain. Let us consider the general supply chain as consisting of cultivators, manufacturers, testing labs, transporters, distributors, and retailers. Within these, license legislation is regulated by three different government sects; CalCannabis Cultivation Licensing for cultivators, The Manufactured Cannabis Safety Branch for manufacturers, and the Bureau of Cannabis Control for the remaining. The only explicit licensing restriction prevents licensed testing labs from holding any other form of licensure. Apart from this, "a person may apply for and be issued more than one license (under this division)",[22] given their business will incur the corresponding licensing costs. However, the mere permittance of vertical integration in this regard does not mean the conditions in place work in its favor. The acquisition of any license type incurs a small application fee followed by a much more substantial annual fee based on the type of license in question and/or a firm's annual revenue; There is one license type (microbusinesses) that serves

[22] *California Legislation Information*, Business and Professions Code, Division 10, Chapter 5.

to license various levels of the supply chain (manufacturing, cultivation, distribution and retail) within one "microbusiness". However, such licensing explicitly limits the capacity of cultivation and means of manufacturing.[23] To expand in either of these regards, a business would have to acquire all the corresponding licenses in place of the strictly bound microbusiness, as opposed to simply acquiring additional licensure. Thus, the extent of vertical integration is limited not only by the prohibited integration of product testing, but increasingly burdensome licensing fees. Essentially, the basis of cannabis licensure regulation enforces a system whereby vertically integrating beyond a given point will no longer be cost-efficient. This works in tandem with the taxation established by prop 64 whereby firms are taxed on retail sales and cultivation of cannabis. Thus, firms must also be willing and able to pay the taxes (variable costs here), in addition to licensure fees, incurred by vertically integrating different levels of the supply chain. In all, the regulation currently in place raises both fixed and variable costs of firms across the cannabis supply chain; thus in the instance of complete vertical integration these costs would stack to deterring levels. Therefore, given that a firm will integrate at the level which minimizes transaction costs, the regulation-induced costs will, despite on one hand instigating integration, effectively cap the extent at which firms will logically integrate by making transaction costs so high. With this, regulation enforces a dynamic where the market is heading in the direction of oligopoly but is unable to reach it and thus unable to reach a price-level that directly rivals the illicit market.

This demands weighing the contribution to a consumer's willingness to pay from the implicit vertical differentiation between illicit and legal cannabis products; legal products hold an advantage in their quality and health assurance. Here it is necessary to gauge the size of the illicit

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[23] Feldman, Todd. "Learning from the First Wave Part 2: California's Cannabis Supply Chain and Vertical Integration, with a Grain of Salt." *Cannabis Industry Journal*, 9 Feb. 2021.

and legal market versus one another as indication of consumers current valuation of the legal guarantees over illicit pricing as well means of estimating price elasticity. In 2019, legal cannabis market spending stood at \$3.7 billion, while illicit market spending boasted \$8.1 billion.[24] Those numbers indicate consumers are clearly comfortable with purchasing illicit products. Similarly, the clause of prop 64 granting local municipalities legislative authority of cannabis has led to a small fraction of California's municipalities to provide cannabis licenses; naturally, the illicit market must not conform to such a limited consumer base. It is clear that the abundance of close substitutes offered by the illicit market is very substantial. Thereby, consumers are made very price sensitive and while they may be willing to pay more for legally assured products, previous and current data indicate the numerous regulatory forces driving up legal prices create a substantial enough gap for price-elastic consumers to resort to illicit alternatives. While there is no denying the vertical advantage of legal cannabis products, in what would theoretically be a very price elastic consumer climate, these advantages would inevitably be dampened. This begs the question: how should legal firms further compete with the illicit market and capture their consumer base?

Well it is clear where the legal market is advantaged and disadvantaged. While their products are differentiated in quality and health assurance, the abundance of illicit substitutes largely mitigates any legal consumer demand this might induce. Thus, legal firms should focus on accentuating their differentiated advantage and producing products for which the vertical difference in health/quality assurance is greatest/most appealing to consumers. With their more complex, manufacturing-based production processes, derivative cannabis products like vapes and edibles from the illicit market have earned a bad reputation for commonly being fake and/or

[24] Adams, Tom, editor. *California: Lesson from the World's Largest Cannabis Market*. Arcview Market Research in partnership with BDS Analytics, 2019, 6

dangerous. Within the past two years, there have been nationwide calls to boycott all illicit products of this nature as per numerous instances of death and illness at their hands. With these illicit products holding such a reputation, they can be considered less "close" of substitutes to legal products of the same nature. Such a dynamic suggests consumers would be less price elastic in regards to specifically derivative products. Furthermore, in recent years derivative products have become even more popular in the legal market than traditional "flower".[25] If legal firms approach competition with the illicit market by emphasizing production in these derivative products, the further differentiation and appeal to consumer interest will lower consumer price elasticity thus preventing their higher prices from driving consumers away and allow legal firms to capture greater shares of the market. Given how regulation limits the vertically integrational means of competing with the illicit cannabis market, this specialization in derivative differentiation seems the most logical next step alongside horizontal integration to extract surplus from illicit markets.

Despite the promise of product differentiation within the legal cannabis market, there is no denying the restrictive nature of California's present regulation. While such measures are obviously implemented with public health in mind, a precautionary approach of curtailing the cannabis accessibility via tax and licensure hardly limits cannabis consumption, instead turning it's consumers to illicit and very possibly dangerous means of acquiring their desired product. Given how it raises producer transaction costs while limiting their means (vertical integration) of mitigating such costs, thereby consumer prices, pushing both to operate instead on the illicit market. Considering the entire social wellbeing, this only hurts legal producers, encourages illicit ones, and leaves consumers risking their (much more valuable health) for slightly better prices.

[25] Adams, Tom, editor. *California: Lesson from the World's Largest Cannabis Market*. Arcview Market Research in partnership with BDS Analytics, 2019, 16-17

To put that in explicit terms of surplus, the legal producers and consumers lose. While the intention of regulation has proper intentions, it is not the best means of accounting for an industry’s effect on public health as it actually adversely influences the people’s health as well the industry’s producers and consumers. Seeing as how the regulation prevents legal firms from vertically integrating to a maximally efficient level, there-in raising consumer prices, pushing both to the illicit market and putting consumer health at risk in the process, it is conclusively denying the market of surplus on both the consumer and producer behalf.

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