



SECTOR ANALYSIS

Medicinal Marijuana

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Strengths

- Restricted entry with Tax revenue expectations
- Test requirements greater than vitamins, less than pharmaceutical (cost control)
- Cheap to Produce, expensive to process. (Barrier to entry)
- Potential Large Domestic Market

Weaknesses

- Negative Stigma as a restricted drug with adverse side effects (refer madness)
- Regulations subject to change without notice
- Profitability is relatively unknown, significant illicit competition potential
- Medical product not covered by insurance companies nor sold by Pharmacies

Opportunities

- Young market, growing potential in users and customers
- Opportunity for tax revenue
- Growing demand both medical and recreational

Threats

- Constantly changing regulations
- Subject to international trade once legalized
- Slow to market and cash flow after financial capital deployment
- Exposed to many risks and price pressure from illicit sources

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History of Medical Marijuana Use

The use of marijuana (also referred to as cannabis) has been documented as far back as ancient China. The world's oldest known pharmacopeia, the *pen-st'ao ching*, references the psychoactive qualities of the drug. Drafted during the first century, it is an accumulation of almost three thousand years of medical traditions (Zuardi, 2006). The most notable uses for marijuana were: rheumatic pain, intestinal constipation, reproductive disorders, and malaria. In early modern medicine, the drug was used to treat the same afflictions it had been prescribed for in the past. The United States included marijuana in the official U.S. Pharmacopoeia until the early 1940's. Social pressures and increased regulation from the 1937 Marijuana Tax Act pushed for reclassification as a schedule II substance, making marijuana illegal to use both recreationally and medically. In 1939, the New York Academy of Medicine began a study to determine the effects of smoking marijuana. They concluded their research in 1944 and consented that cannabis is not harmful to human health and does not lead to addiction in the medical sense of the word (Porter, 1997, p. 666).

We have since discovered that the use of marijuana can lead to adverse health effects. The Australian Department of Health published the "Health and Psychological Consequences of Cannabis Use". This comprehensive study examines the adverse health effects of acute and chronic cannabis use. They reviewed numerous physiological health effects including anxiety, panic, paranoia, and psychotic symptoms (Contributor, 1996). The article further warns of increased risk of respiratory diseases such as bronchitis. The Australians found that much like similar drugs on the market, consumption possesses a degree of risk that one must understand before use. All things considered, many patients vastly prefer the benefits provided by marijuana than those of traditional pharmaceuticals. Marijuana's prohibition has made it difficult for researchers to explore the entire spectrum of diseases and conditions that may respond to cannabis therapy. Professionals have identified wasting syndrome, chronic nausea, symptoms of cancer, AIDS, multiple sclerosis, epilepsy, neurological dysfunctions, and gastrointestinal disorders as conditions where marijuana has an enormous impact on a patient's well-being (Philippe, 2012).

The past five years have been a time of reform for not only marijuana but restricted substances in general. The recent push for decriminalization and a vastly improved public image has encouraged thousands of institutions to conduct in-depth studies on the therapeutic benefits.

Complete overhauls of medical marijuana laws have occurred throughout the developed world. In the United States and Canada, legalization for medical use has been granted by many state and provincial governments.

The Regulatory Environment

Canada has provided patients access to medical marijuana since 2001 under the Marihuana Medical Access Regulations (MMAR). Physicians received the right to prescribe cannabis to patients with severe pain, epilepsy, or debilitating symptoms and conditions (Health Canada, 2005). The system allowed patients to purchase medicinal marijuana from a government approved vendor. Alternatively, they could buy seeds from Health Canada to grow their supply at home. Both methods came with extensive rules and regulations for participants to follow. As the number of participants grew the program suffered widespread abuse; benefits were only enjoyed by those involved in the program (Department of Health, 2012). In fact, an internal program audit found that there was no social benefit and producer surplus was non-existent (Department of Health, 2012).

Regulatory reform was introduced in 2012 and implemented in April 2014. The Medical Marihuana Access Regulations (MMAR) was superseded by the Marihuana for Medical Purposes Regulations (MMPR). New regulations no longer require tens of thousands of patients to register with Health Canada, thus reducing administrative costs and shifting government attention to just a handful of licensed producers. The new laws forbid private cultivation and retail distribution, requiring all patients to purchase directly from licensed dealers. This effectively eliminates public safety risk linked to home-based hydroponic operations and any potential for violent crime and theft.

The black market has been the primary distribution point for the recreational user and many medical users. The government addressed two problems that arose in the old legislation, first was the increased risk of robberies and the lack of security placed on private grow operations. Granted, the amount of marijuana entering the illicit market through crime was quite small, the new regulation aimed to protect medical users from criminal gangs that target private growers (Department of Health, 2012)

The second and most common problem was deliberate over-production by licensed individuals who sold their surplus to the black market for a profit (Department of Health, 2012). The government was well aware of the resources required to monitor the thousands of people in the program. Both problems were eliminated by licensing for-profit companies with exclusive distribution rights and equipping them with expensive state-of-the-art security systems; including safes, motion detectors, and advanced camera systems.

Aspiring producers may now apply for a license that authorizes them to cultivate and harvest marijuana up to a maximum quantity and sell only dried marijuana to eligible patients. In the early days, the government received 450 applications with 25 coming in every week (The Canadian Press, 2014). Recent application status data is presented in Figure 1, with data collected from; “Corporations move in on Canada's medicinal cannabis industry” by Travis Lupick and: “Medical marijuana industry competes for scarce investment dollars” by Omand Geordon.

The Canadian system has focused on a centralized wholesale approach and instituted this program at the federal level. In the United States, the U.S. Food and Drug Administration has yet to approve medical marijuana for use in any capacity, leaving it classified as a controlled substance at the federal level. The U.S. Justice Department has stated that it will not counteract states that legalize marijuana “as long as [adequate] controls are in place” (Hendrick, 2015). As of 2015 there are twenty-three states that have legalized or decriminalized medical marijuana. Some states

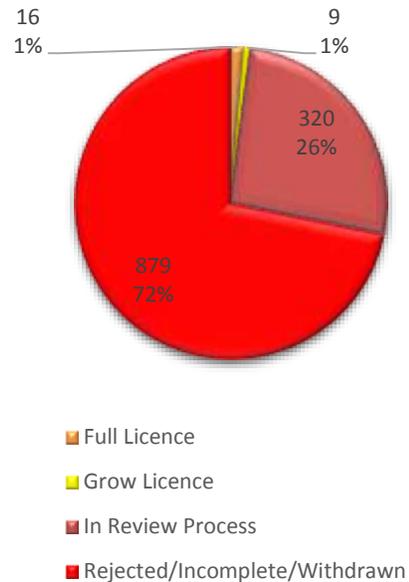


Figure 1: Application Data from early 2015. (Lupick, The Georgia Straight, 2015) And (Omand, 2015)

including; Washington, Oregon, Colorado, the District of Columbia, and Alaska have legalized **recreational** marijuana with few restrictions. Of all twenty-three states, the only thing they have in common is the lack of consistency in their marijuana programs. For example, only a third of the states use retail stores called ‘dispensaries’ to distribute marijuana, others rely on university medical centers or state offices (Hanson, 2015). Many states have added restrictions on the products being sold through their distribution networks. In most cases, the state will dictate the maximum potency or a maximum concentration of compounds within a strain. Some states have banned the sale of combustible products; limiting the product range to edibles, liquid extracts and oils (Hanson, 2015). People with chronic conditions are often forced to travel out of state to find a recommended product or strain because the list of eligible conditions varies from state to state.

The inconstancy in American marijuana regulations is making it difficult for doctors to use the medicine. The F.D.A and DEA are two federal agencies that oversee drug prescription programs in the United States. Both of these agencies are bound by federal law and are publicly against the use of medical marijuana. Consequently, American doctors are unable to issue formal prescriptions for marijuana without breaking the law. The state governments have developed a system to bypass this restriction; they have allowed their doctors to issue a ‘recommendation’ in the place of a prescription. The patient then takes that ‘recommendation’ to a distributor for fulfillment (Kondrad, 2013).

The merits of the medical marijuana business are still being argued at all levels of government. The developing sentiment is the benefits outweigh the potential risks. Many predict that the remaining states will follow suit and adopt a similar policy to those of the first twenty-three. The federal government’s standpoint is the fundamental problem faced by the marijuana movement. When deregulation occurs, the United States is much more likely to see a nationwide standard that simplifies the process. Jacob Appel authored an article that described the similarities between the prohibition eras of the mid-1920’s to the rise of medical marijuana in our age. The author contrasts the early physicians who lobbied to prescribe alcohol to their patients. These doctors were not looking for alcohol legalization; they were alarmed by the limits and regulations being imposed on their profession (Appel, 2008). Numerous examples show parallels: one Ohio practitioner stated "Whiskey as a medicine is fine, as a beverage it is absolutely unnecessary." Another believed: "the

enforcement of the prohibition laws [had led to] unnecessary suffering or death". The same arguments are made ninety years later. However, that argument has shifted from medicinal Canadian Club to medicinal Purple Kush.

Market Growth in Canada and the U.S.

Canada's Department of Health foresees the Medical Marijuana industry growing well over 1 billion dollars in the next ten years (Department of Health, 2012). They anticipate the creation of thousands of jobs, and they use an increased headcount in the Program's office as an example. When looking at the participation numbers there has been a dramatic increase since 2001. Numbers reported in 2002 show a mere 477 individuals were authorized to possess marijuana (Department of Health, 2012). After ten years, the program had reached 21,986 individuals. The velocity of growth led to the 2014 estimate of 50,000 users.

The growth estimates for the first ten years of the MMPR assumed an initial (2014 base year) participation of 57,799 users with approximately 40% per annum growth per year. The result is 433,688 participants in 2024 with an upper program limit of 450,000 (Department of Health, 2012). This projection provides two crucial pieces of information;

- (1) According to the MMPR documentation and various news reports, the future value of the Canadian medical marijuana market is 1 billion dollars. As of 2024 the number of participants will be approximately 430,688. Assuming each user requires an average of 1 gram per day being sold at a median price of \$9; the annual revenues for the industry will be 1.4 billion dollars. It comes down to slightly over 1 billion '2014 dollars' if you factor in an inflation estimate of 3% per annum.
- (2) According to the Canadian Alcohol and Drug Use Monitoring Survey, in 2011 there were approximately 420,000 Canadians that use marijuana for 'medical purposes' (Health Canada, 2011). The information given in the MMPR is effectively saying it will take ten years to convert the user base from the black market to the legal.

One of the limits to growth will be this black market. The Department of Health had projected between one and two years for companies to pass the 'start-up' phase of their

development (Department of Health, 2012). In practice, this has not been the case. When examining the financial information from large public firms, many have expressed concerns regarding the long holding period before they receive their license. A number of operations report using their facilities to grow vegetables while they wait for Health Canada to grant their license. This is affecting the quantity of product available for sale and thereby making it less desirable for customers to purchase from a legal source when they can buy illegally for the same price.

In the United States, the cannabis market as a whole is estimated to be worth anywhere from 10 to 45 billion dollars with approximately 23.9 million active users (National Institute of Drug Abuse, 2014). This amounts to roughly 7% of the population considering themselves an active user. In Canada, that percentage is closer to about 10%; 3% higher or about 3.3 million people (Health Canada, 2011). Altogether the North American marijuana market consists of approximately 25 million people. There is a very high likelihood this number would increase following deregulation. In the United States, nearly half the population claims they have tried marijuana (Motel, 2015). In Canada, 40% report having used it at least once in their lifetime (Health Canada, 2011). This can be used to insinuate potential growth of 160 million in the US and roughly 13 million in Canada in the event of legalization. At current prices, this growth scenario generates well over 100 billion dollars and massive upside potential for an already established medicinal producer.

For an established company, there are opportunities to expand through mergers and acquisitions. The company Cannabis Science has already undertaken a merger with Hempola (CANNABIS SCIENCE, 2015). The advantage to this strategy is the avoidance of expansion risks that are present when a business decides to grow. Merging with or purchasing a competitor who already has the type of specialization you desire is a less-risky way to expand a business. Moreover, there are numerous venture capitalists that are looking to invest in marijuana start-ups. PharmaCan Capital has announced investments in three marijuana outfits across Canada and claims to have raised over 10 million in the past year (The Canadian Press, 2014). As more licenses get approved, and the market becomes increasingly competitive, these investment opportunities will dwindle.

The medical marijuana industry is in the early stages of its growth cycle. Public sentiment towards marijuana has changed since the days of Reefer Madness. For the first time in the United States, gallop polls show 53% favor legalization and 77% support legalization for medical purposes

(Gupta, 2015). Even in the last couple years there has been an 11% increase in support that contradicts the late 1960's, where a mere 12% were in favor. With public opinions trending upwards, scores of opportunities have come available. In the United States, marijuana by-products and processed goods have proven to be a profitable market that is alluring to those apathetic to smoking.

Effects on Economic Surplus

The physical location of marijuana growing operations has an immense impact on profitability and tax revenues for the government. The MMPR has suggested that regions with a disproportionate number of participants to producers will have an adverse overall effect (Department of Health, 2012). The distribution of licenses to possess and grow are presented in Figure 2, and 3 of Appendix II. They are based on data collected from the Health Canada archives (Health Canada, 2013). The charts show that British Columbia and Ontario had the largest quantity of users while the Prairie Provinces had the fewest. In terms of concentration, the Western Provinces, and the Maritime have the most users relative to their populations. However, the percentages are within the range of five and ten basis points. This is misleading because it makes the 2500 person market seem desirable when it is proportionately smaller. This irregularity is why Health Canada has suggested that some regions will inevitably have an unproportioned share of the eroded consumer's surplus under MMPR.

The loss of consumer surplus will occur due to the ban on personal cultivation and a **projected** increase in the price of marijuana over the next ten years. The Department of Health has expected an increase from \$7.60 per gram to roughly \$8.80 in 2024 (Department of Health, 2012). Although a price increase would generate more tax dollars for the government, the participants of the program are very sensitive to changes in price. Keep in mind that users of medical marijuana programs are sick, many are unable to work, leaving them reliant on fixed incomes to survive. Any price inflation will decrease the purchasing power of that individual's income. Price projections are known to be inaccurate and often fail to reflect on relevant findings from similar markets.

There have been noteworthy market fluctuations in the United States after allowing the sale of marijuana in legal markets. Many states heavily enforced their production quotas in order to

prevent an unmanageable amount of marijuana from hitting the streets. In one example, an ounce of marijuana was selling for \$500 or approximately \$18 a gram plus applicable taxes (which can be as high as 30%) (Wyatt, 2014). Over regulation lead to price inflation, resulting in customers looking towards the black market or merely leaving the market altogether. Another problem that arose is the inefficiency of the market. Implementing production quotas will either eat away at consumer surplus if production is too small or producer surplus is too high. For the first few years of the program, the market is likely to remain inefficient. The government may take the hands off approach when the industry matures and a competitive market is established. With the exception of states that have fully legalized marijuana, tracking the amount of product being sold will be relatively simple since distribution is often achieved through a single entity, such as a university or state office. Once demand levels are established, governments can better determine the appropriate amount to produce until further deregulation occurs.

In Canada, the producers are regulated by Health Canada, and the quantities they are entitled to provide may change year to year. The result will be an inefficient market because the quantity supplied is unlikely to align with the quantity demanded by the market. However, the newly implemented system will have noticeable social benefits greater than the previous legislation. Profits for producers will drive a new business that will vastly increase tax revenue. Unfortunately, consumers will face higher prices than they did under MMAR. Commercial farmers face significantly higher overhead costs than individual growers, but their genetic accuracy and consistency is substantially higher than what a private cultivator can achieve (Department of Health, 2012). Unlike individual farmers, the product bred by commercial producers is required to pass Health Canada inspection before it can be consumed. Furthermore, the quality of the facility and the health of the plants are monitored. These additional precautions help prevent the contamination that often occurs in private cultivation.

Consumer Base

There are many patients who may benefit from the use of marijuana. Some have suggested that any disorder involving inflammation or wasting can be treated using the drug. Inadequate research and documentation have led some doctors to refrain from prescribing the drug (Enright,

2015). In fact, the Canadian Medical Association has gone so far to say “there is insufficient scientific evidence available to support the use of marijuana for clinical purposes.” Critics have argued that the best way to collect data on marijuana use is to test using evidence from real-world patients. The argument is the drug has been in use for thousands of years and has been shown to possess only a few side effects. However, doctors are more than willing to prescribe relatively new pharmaceuticals that are known to cause severe side-effects (Enright, 2015). Testing of Pharmaceuticals is the financial responsibility of the company, and the marijuana industry has been structured to avoid that obligation. They had tried to lay the requirement on the Government or avoid it totally using the model of the vitamin producers. Furthermore, large segments of patients using pharmaceutical drugs could be swayed by low switching costs to medical marijuana; presenting significant competition to the pharmaceutical industry. Knowing legislative bodies and influential organizations are opposed to marijuana is certainly in their best interests.

As of the current legal environment, producers may cater to individuals who hold a prescription written by a medical doctor. It is important to note that these are the *only* individuals with whom they can conduct business. Some producers have argued that federal advertising rules are “impeding their ability to adequately inform doctors and patients of treatment options” (WOO, 2015). Advertising directed to a consumer that does not have a medical prescription is strictly forbidden. Furthermore, any advertising efforts within the authorized market must follow a set of rules. For example, they are barred from advertising the benefits of a particular strain or posting its picture. One producer describes his website as “clinical-looking” after removing the disallowed material (WOO, 2015). These regulations likely serve two purposes:

- (1) The Canadian Medical Association has yet to approve marijuana for clinical use due to insufficient scientific evidence. Therefore, the government does not want firms to spread information that may later prove to be nonfactual.
- (2) The government is proactively seeking to discourage abuse of the program. The less enticing the product appears, the less likely for abuse.

It is important that legal producers maintain market share over their black market counterparts. A great example of innovation from the United States is an edible product. Medical

marijuana is legal in many states, but in some it is still illegal to sell dried marijuana buds. Many shops have begun selling products derived from marijuana such as baked goods infused with marijuana, cooking ingredients, oral sprays, and gel capsules (Woolf, 2015). Processed merchandise amounts for half of the sales in the US, largely because for many legal users it is their only option (Rosolen, 2014). The edibles craze is a much better alternative for individuals that find smoking revolting or uncomfortable. In Canada, there is an oral market, but it represents a subtle portion of the overall sales. Edible products must be made by a consumer and cannot be sold by a licensed producer.

A number of alternative products are already in the Canadian market but are not well known. For example, Sativex® is a cannabiniol-based oral spray used as “treatment for symptom improvement in adult patients with moderate to severe spasticity due to multiple sclerosis (MS)” (GW Pharmaceuticals). Sativex is for the treatment of muscle spasticity but has been found to be useful treating pain caused by numerous conditions. Cesamet® is a capsule containing nabilone, a synthetic cannabinoid, used for treating nausea and vomiting associated with cancer therapy (Cesamet, 2015). A number of drugs are already in use in North America; there is an established regulatory precedent. Partnering with pharmaceutical companies opens up limitless opportunities for developing new types of products to complement marijuana sales.

An often overlooked secondary market is the hemp industry. Products manufactured with hemp range from food, building materials, paper and even jewelry. Estimates put global sales in the range of \$580 million and the number of hemp-based products at roughly 25,000 (Johnson, 2015). Although hemp is genetically different and used for a diverse range of product, it is still classified under Schedule II. Large scale hemp production gives growers access to a new market with a vast array of products spanning multiple industries. The states with marijuana legalization have already seen a growth in the market. One of the major advantages of hemp products is they are legal in all jurisdictions in North America, meaning producers can ship their product anywhere. This is an inexpensive way to expand customer base without having to make significant alternations to existing infrastructure.

Pricing

In the black market, marijuana tends to be priced between 10 and 15 dollars per gram, depending on the quality. Producers have stated they are capable of growing and harvesting at a cost of \$.80 per gram (Strauss, 2013). The ‘street’ price was largely propped up by a risk premium added at the wholesale and dealer levels. Even under the new legislation, many producers are hopeful they will be capable of growing with costs in and around the one dollar range.

Current prices range from seven to fifteen dollars per gram depending on the strain. For many of the new start-ups, these prices are not providing enough margin to cover expenses. Brent Zettl, the CEO of Prairie Plant System, and one of the first licensed growers - stated that he needed “minimum of \$11 a gram to stay in business” (Lupick, 2013). This statement does not come as a surprise when looking at the financial data being released by the public companies. Many have a Cost of Goods Sold per unit well over the \$10 mark, others are showing costs of roughly \$4.80. You can typically link a high cost of goods sold to companies with larger operations. Over time, it is likely that their production costs will fall as economies of scale is applied. The legal demand for the crop has not matured to a point where companies can generate adequate revenue to cover costs or invest in more capital. To summarize, the variable cost component appears to be low, and high start-up costs aggravate the current problems.

In the United States, specifically in Colorado and California, there has been a downward trend of marijuana prices. Prior to legalization, it was estimated that Colorado would earn \$40 million from excise tax revenues (Brown & Resnick, 2013). Analysts from Colorado State University evaluated the assessment and presented \$27 million as a more realistic return. The loss of tax revenue is a result of falling prices in the industry. Initial estimates for a pound of marijuana were around \$1,100, but market prices are showing in the \$600 range, half of what was expected. A similar scenario occurred five years ago in California’s booming *medical* marijuana market where prices fell below the \$2000/pound rate that had been the norm since the early 1980’s (Montgomery, 2010). Colorado decided to apply a regular sales tax of 10% with an additional 15% excise tax aimed to raise money for social projects (Brown & Resnick, 2013). The falling price of marijuana threatens the revenues earned from taxation. If prices are too low, the program’s cost may exceed revenues. Furthermore, the revenues generated in the first few years will be a result of the ‘wow’

factor. Large portions of the program's initial revenues are from marijuana tourism that will certainly decline over time.

Risk Profile

The risk exposure of the medical marijuana industry is similar to that of any business in a young industry. Most of the firms are start-ups that face significant financial risk in addition to the risk inherent to a heavily regulated industry. The most notable concern is each company's reliance on their Health Canada license. Without this authorization, their business has to halt production or shut down. These companies do not receive a guarantee their license will be extended or that their production quotas will remain constant (Tweed Marijuana Incorporated, 2014). Furthermore, having the license does not protect against changes in the regulation. At this stage of development, businesses need to be ready to adapt. This caution must include attention to the political environment. Proposed changes like legalization will have a dramatic effect on everything from production levels to marketing, firms should position themselves to be triumphant in any regulatory environment.

Financial risks are prevalent in most of the young companies in the industry. This is especially noticeable in businesses that were established but unable to begin growing operations until they received their license. Many had taken upwards of two years before they generated revenue, requiring the firms to operate entirely on external financing. Equity financing primarily provided this, but some companies raised funds through short-term notes payable. There have been some instances where companies have become, or closely avoided, insolvency. For example, Cannabis Science had to enter into a debt extension agreement with one of its financiers to prevent defaulting on approximately \$1.84 million of promissory notes" (CANNABIS SCIENCE, 2015). Current shareholders face the risk of dilution of their equity shares if the firm is required to raise capital through equity funding. This is important to note because it is **commonplace in this industry**. The value of that investment presents a risk to both the company and the investor. The value of any equity capital can fluctuate very quickly with the relatively small number of issued common shares. A change in regulatory policy or earnings reports from foreign markets, like the United States, may have significant effects on the value of a firm's equity.

An undesirable consequence of being a start-up is there is no operating history to reflect upon, raising the concern of whether or not the business can generate *profit*. This makes it difficult to forecast for both an individual company and the industry as a whole. A projection released by Health Canada alongside the MMPR has initiated the most analyst forecasts. It is extremely difficult to be accurate because changes in price and quantity are unpredictable, and the assumptions made by the government do not reflect findings in similar markets. Successful forecasting of economic trends, new activities, or new tax revenue streams is not the strong suit of the government. In the United States, few projections have been accurate due to difficulties in estimating the price of marijuana in a particular region. Inability to forecast financials will continue to be a risk until the market begins to stabilize.

One of the closest industries to medical marijuana is agriculture as both tend to face similar operational risks. Marijuana producers are heavily dependent on their facilities, a loss due to accident or security breach would undoubtedly halt production and potentially result in Health Canada pulling its license. A loss could also occur in the crop, Health Canada has required producers to design their facilities to avoid agricultural risks. Insects, mold, and plant diseases are examples of threats that could render a producer inoperative. Annual operating costs from rising energy prices or even government fees could be damaging to a business struggling to generate profits. According to Health Canada, companies should anticipate spending \$394,636 annually on new equipment, security, and record keeping in addition to their regular operating expenses (Department of Health, 2012). Producers should also expect to be compliant with any environmental regulations, especially those related to handling hazardous materials and chemicals.

The marijuana market will be home to a set of business risks that start-ups must be cognizant. At the time of writing, there are approximately 25 active licenses and 16 that are fully authorized to grow and sell. As this number increases over time, competition will get fiercer. Firms with less experience or less capital may not be able to survive a new wave of competitors; not unlike the craft beer industry over the last twenty years. Any firm that has gone public through the TSX Venture Exchange may also face trade risks. Part of their agreement states that they will “only conduct the business of production, acquisition, sale and distribution of medical marijuana in Canada as permitted under the License” (Tweed Marijuana Incorporated, 2014). If some firms have

agreed only to operate in Canada, they will be missing out on a massive export market in the United States and abroad.

There are liability concerns regarding a firm's risk exposure if someone is injured while using the product. The MMPR guidelines precisely describe how safety labels are to be applied. However, this does not provide legal protection from irresponsible users. Recalls will also be a responsibility of the company. It should ensure the necessary infrastructure is in place to handle such an event.

The last major risk pertains to public opinion, arguably the driving force behind the medical marijuana movement. Poor opinion stirred by bad press, a change in regulation, or damaging research reports can easily be a trigger for many of the risks above. For any marijuana business to succeed, it must have support from the community, especially from those in a position of power.

Porter's Five Force Model

Threat of New Entrants

The medical marijuana industry has very high barriers to entry. Most notable is the licensing process, which is known to be very expensive and lengthy. The equipment to be competitive is also very expensive. Investments of well over 5 million dollars are required to fund an operation. Stiff regulation makes it undesirable for established agricultural specialists. In the early stages of the business, customer loyalty has yet to be established, so it is still possible to differentiate yourself with a brand. New entrants will find the costs benefits from economies of scale attractive. Few facilities have this advantage as demand has yet to require companies to commit their full armament of equipment to production.

Substitute Products

There are few substitute products for marijuana. For most users, it is considered the substitute for pharmaceutical pain killers or a surgical/medical intervention by a doctor. However, the substitution of an illicit product for price reasons does represent a significant risk.

Bargaining Power of Buyers

In Canada, buyers have very little bargaining power in the heavily regulated market. If the buyers were to make a demand, the sellers are unlikely to budge at the risk of losing their Health Canada license. The industry has very low switching costs, making it easy for buyers to move between sellers. However, the customers are fully dependent on the distribution system unless they go to the illegal market. These buyers are also very price sensitive, especially in Canada where they have seen their expenditures multiply. In the US states with legalized recreational marijuana, buyers have more bargaining power because sellers can better control their operations. In states without legalization, they are in a similar situation to Canada.

Bargaining Power of Sellers

Sellers include Health Canada and overseas merchants that provide plants and seeds to Canadian producers. Canadian companies can import from hundreds of suppliers, resulting in low switching costs. Electrical companies are suppliers who may potentially have some influence. Privatization of public utilities may require producers to enter exclusive agreements with service providers.

Competitive Rivalry

There is weak competition at the moment. Nonetheless, this is expected to rise as more companies receive their marijuana licenses. In Canada, the playing field is relatively level since everyone has to follow the MMPR regulations. In the legalized states, it is a free market. We have seen the competitive market erode prices and decrease tax revenues for the government. Protocols implemented by both Canadian and American lawmakers have stunted innovation. Restricting the types of marketable products is harmful to the industry.

Projected Tax Revenue

Governments have an active interest in medical marijuana for its potential to generate revenue. Using a set value for the price along with the framework provided by Health Canada it is possible to project revenues in each province over the next ten years. The spreadsheet used to calculate the following two sections is provided in Appendix III.

Daily use is expected to fluctuate depending on the user. Individuals with severe conditions will likely consume an average of two to three grams per day and for those with mild conditions less than a gram. For the purpose of this forecast, an individual's daily consumption will be 1.23 grams per day or 450 grams per annum. The future price is hard to estimate, but American markets have observed a steady downward trend. Prices start at the average of \$9, and will fall 10% per annum to reflect the American trends. Furthermore, we are assuming the government will implement a price floor of approximately \$5 to prevent the market from bottoming out; thereby protecting tax revenues.

The MMAR legislation charged a flat-fee of \$5 per gram, this appears to be the minimum price the government is willing to charge for marijuana (Stambrook, Ireland, & Xie, 2012). The model found in Appendix III uses each province's tax rate to calculate both provincial and federal revenues. The model allows the user to examine the impact of a 'Colorado-style' excise tax on future earnings. Implementation has yet to occur, but it is possible the government will peruse additional sources of income as the program evolves, or further legalization is carried out. The information found in Table 1 applies the projected growth rate of 25% per annum to the initial numbers provided by Health Canada. However, Health Canada projected an annual increase of 40% per annum; using 25% stays within the ten-year program limit of 450,000 set forth in the legislation. Table 2 of Appendix III shows the annual revenue for each province over the next ten years with total collections across Canada highlighted.

The data shows that tax revenues will increase by an effective rate of 25% throughout the first ten years. Any growth after that will continue to yield substantial revenues for the government provided the price stay relatively high. Administrative costs are expected to be small, however those with fewer participants will not find the program as profitable.

Projected Corporate Revenues

Expanding upon the model used in the tax estimation makes it possible to project corporate revenues for the same ten-year period. Using the same pricing model as above, we will introduce the Cost of Goods Sold variable to represent an (estimated) average production cost across the market. Table 3 of Appendix III displays demand given the average annual consumption and estimated program size. The model also factors in efficiencies gained by economies of scale. The cost of production is estimated to improve by the same rate at which the market is growing (25%); eventually reaching \$0.80, the minimum production cost forecasted by producers. The initial value of \$10 originates from the financial statements of public companies and reports from industry professionals.

Falling costs and a growing market will result in increasingly higher margins over time. If we maintain the previous assumptions, by 2024 the market could potentially generate 1 billion dollars in revenue and over 800 million in gross margins. Looking forward, the most significant risk to an individual firm's revenue will be competition. Late entrants will be at a disadvantage against their competition who have already passed their start-up phase. A further risk is found in patients propensity to consume. A mild dosage was estimated at approximately 450 grams per annum, costing \$4050 in the first year. Heavy users could expect to spend upwards of \$10,000 on this treatment. For that reason, macroeconomic conditions affecting consumer spending and disposable income will inevitably impact demand. Important factors to examine will be inflation and the resulting effect on the market's purchasing power along with government health care spending. Any cuts to social services, like disability, present a significant threat to the industry.

Summary

In summary, medicinal marijuana's resurgence has been met with strict regulations and many skeptics. However, the opportunities for health care and economic growth are too valuable to forego. This industry is for those who are looking long-term and have the desire to contribute to a young industry. Nothing in this business is a sure-thing. Investors and entrepreneurs must be able to adapt to ever-changing economic and political surroundings. Anyone with a small business mindset can succeed and thrive in this industry.

Appendix I: Brief Analysis (For Use on Cover Page)**SWOT***Strengths*

- Restricted entry with Tax revenue expectations
- Test requirements greater than vitamins, less than pharmaceutical (cost control)
- Cheap to Produce, expensive to process. (barrier to entry)
- Potential Large Domestic Market

Weaknesses

- Negative Stigma as a restricted drug with adverse side effects (reefer madness)
- Regulations subject to change without notice
- Profitability is relatively unknown, significant illicit competition potential
- Medical product not covered by insurance companies nor sold by Pharmacies

Opportunities

- Young market, growing potential in users and customers
- Opportunity for tax revenue
- Growing demand both medical and recreational

Threats

- Constantly changing regulations
- Subject to international trade once legalized
- Slow to market and cash flow after financial capital deployment
- Exposed to many risks and price pressure from illicit sources

Appendix II: Charts showing MMAR license distribution in Canada (Current as of 2013)

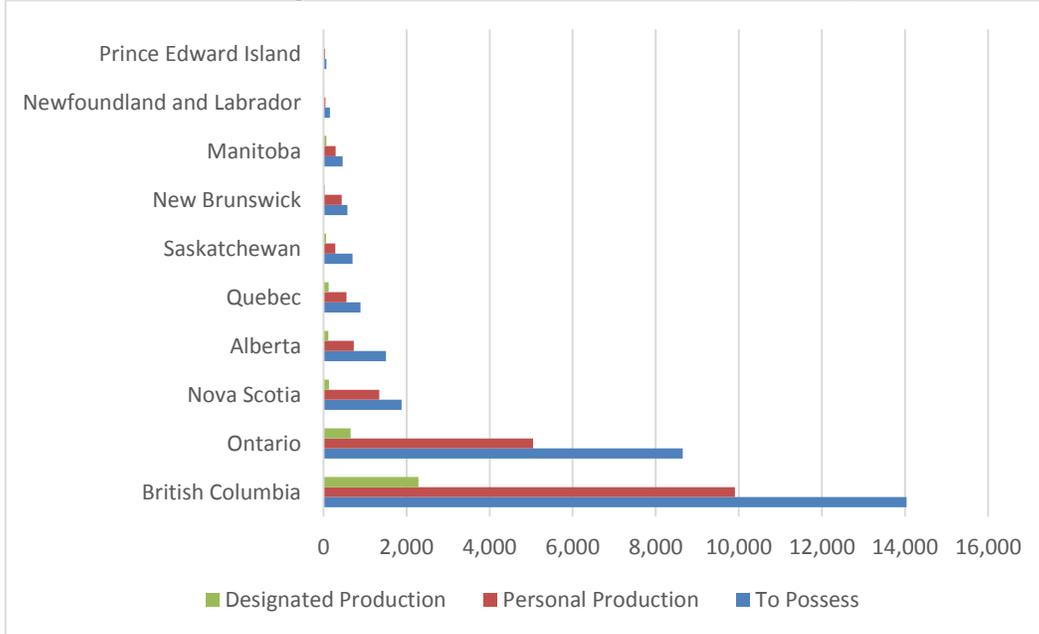


Figure 2 shows the distribution of licenses under MMAR

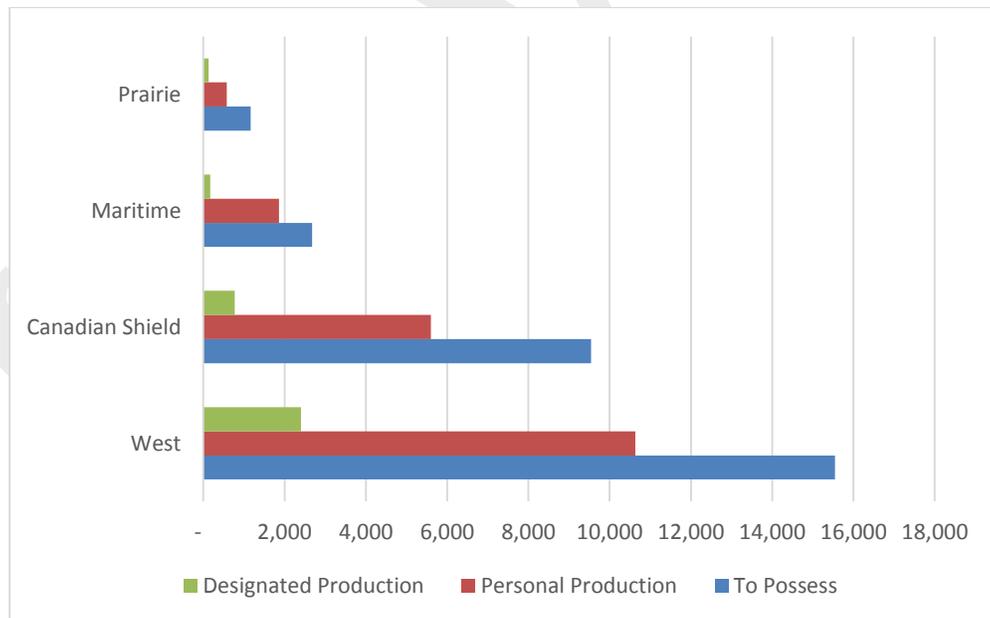


Figure 3 Same data as figure 2, but shows licenses by region

Appendix III – Income Projection for Government and Private Business

Table 1. Estimated program participation in each province over the next five years. Based upon data released through the MVOPI.

Province/Year	2017	2018	2019	2020	2021	2022	2023	2024
Alberta	2,364	2,955	3,694	4,537	5,511	6,631	7,903	9,337
BC	14,803	22,970	34,773	50,564	70,134	93,938	123,613	154,886
Manitoba	855	1,000	1,206	1,470	1,787	2,160	2,598	3,104
NS	805	1,006	1,258	1,572	1,951	2,407	2,942	3,557
PEI	357	430	509	596	692	798	914	1,041
ON	2,803	3,403	4,166	5,007	5,939	6,972	8,106	9,350
Quebec	11,811	13,811	16,211	19,011	22,211	25,811	29,711	33,911
SK	98	123	153	188	228	273	323	378
Subtotal	1,297	1,460	1,720	2,078	2,541	3,109	3,782	4,561
TOTAL	37,723	47,154	58,942	73,878	92,097	113,121	138,302	168,124

VARIABLES

Gross Consumer (AVG/CTGAT)	10%
Proposed Excise Tax	0%
Initial AVG Price/Gross	0.30
Deduction Rate (%)	10%

Note: Health Canada estimated growth of 40% per annum. However the growth rate exceeds their program limit of 400,000 participants by 2024. For the purpose of this projection a 25% growth rate has been stated instead.

Table 2. Displays provincial tax revenue scaled by a thousand dollars. The model has a feature to estimate revenue if an excise tax were to be imposed. Furthermore, it allows the user to adjust for a downward fluctuation in market price.

Province/Year	2017	2018	2019	2020	2021	2022	2023	2024
Alberta	6.00	7.29	8.56	10.00	11.50	13.00	14.50	16.00
BC	47.9	73.7	109.1	154.8	200.5	246.2	291.9	337.6
Manitoba	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2
NS	2.8	3.4	4.0	4.6	5.2	5.8	6.4	7.0
PEI	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3
ON	23.5	28.2	32.9	37.6	42.3	47.0	51.7	56.4
Quebec	10.5	12.6	14.7	16.8	18.9	21.0	23.1	25.2
SK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Provincial	100.0	150.0	200.0	250.0	300.0	350.0	400.0	450.0

Table 3. Provides expected values for annual demand, projected revenue, unit costs, and gross margin.

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Annual Volume Demand	21,210,188	26,523,081	33,116,880	41,483,726	51,854,837	64,755,831	80,344,777	101,101,971	127,426,267	158,315,267	197,413,081
Projected Revenue	296,772,688	354,842,175	432,699,808	531,711,264	649,911,179	794,118,864	974,171,803	1,200,966,973	1,485,903,307	1,837,176,311	2,261,079,617
Estimated Cost of Goods Sold per Unit	10.00	7.50	5.63	4.22	3.18	2.37	1.78	1.31	1.00	0.80	0.60
Gross Margin	21,210,188	26,523,081	33,116,880	41,483,726	51,854,837	64,755,831	80,344,777	101,101,971	127,426,267	158,315,267	197,413,081

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