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INDUSTRY PRIMER

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Cannabis: Almost Showtime

A Legitimate Industry With Potentially $1 Billion Of EBITDA

Beyond The Headlines

What's The Event?

Later this year, Canada will embark on a massive economic and social experiment as cannabis consumption and distribution is legalized. A handful of U.S. jurisdictions have already made this transition, and various countries have significantly relaxed regulations, but there is still a great deal of uncertainty about what this all means.

Implications

We believe that by 2020, the legal market for adult-use cannabis will approach $6.5 billion in retail sales. For context, this is greater than the amount of spirits sold in this country, and approaches wine in scale. We believe the provinces will be the greatest winners from legalization, but the shift from the black market will be a boon to private enterprise as well. As part of the shadow economy becomes legitimate business, we estimate private firms will generate nearly $1 billion in EBITDA.

The establishment of a formal industry creates all sorts of fascinating questions, and providing answers is challenging (but that doesn't keep us from trying). Which producer will emerge as a dominant player? Who will be the top cannabis retailer? Will large, multinational tobacco or alcohol firms rush to the sector looking for new avenues for growth? How large can the international and medical markets become, and how long might Canada serve these global markets before other countries want to own the process themselves? Brand development, merchandising, assortment, pricing, advertising, and derivative products are all subjects we expect to hear more about.

We accept that we are entering a whole new arena, and a macro view is crucial for the industry to appeal to generalist investors and to broaden out beyond the handful of specialist investors who have, so far, won from first-mover advantages. With our framework as a base, investors can haggle on who gets what, and how to value each piece of the cash flow stream, but there is little doubt that the cannabis sector will become more of a mass market equity opportunity.

All figures in Canadian dollars, unless otherwise stated.

For required regulatory disclosures please refer to "Important Disclosures" beginning on page 42.

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Executive Summary

We believe that by 2020, the legal market for cannabis in Canada will involve demand for over 800,000 kilograms with a retail value of roughly $6.8 billion—95% of which will be for adult use (non-medical).

The industry is developing against a backdrop of extensive regulatory oversight that is colored by the federal and provincial experience of other controlled substances such as tobacco and alcohol. Thus, private sector involvement will be limited to different parts of the value chain, largely depending on provincial decrees. As such, understanding the investment opportunities warrants some level of granularity. As a starting point, investors should assume that any value added to distribution (also thought of as wholesaling) of the product will be within the government sector.

In our opinion, by 2020, the private sector should be able to generate EBITDA of close to $1 billion, with production accounting for over 85% of this, and the remainder coming from retailing – largely in western Canada.

Our conclusions are informed mainly by the study in the distribution of alcohol over the past several decades in Canada, but supported by provincial disclosures, publicly available statistics and estimates, and an understanding of the economics of manufacturing and retailing across the country.

For purposes of clarity, in this report we define production as the manufacture of the product (in whatever form it finally takes) and transportation to the provinces. Distribution is the “wholesale” step that receives the product from the producer, and distributes it to the retail entity (private or public sector), or direct-to-consumer through online channels. Retailing is the end function that interacts with the end consumer.

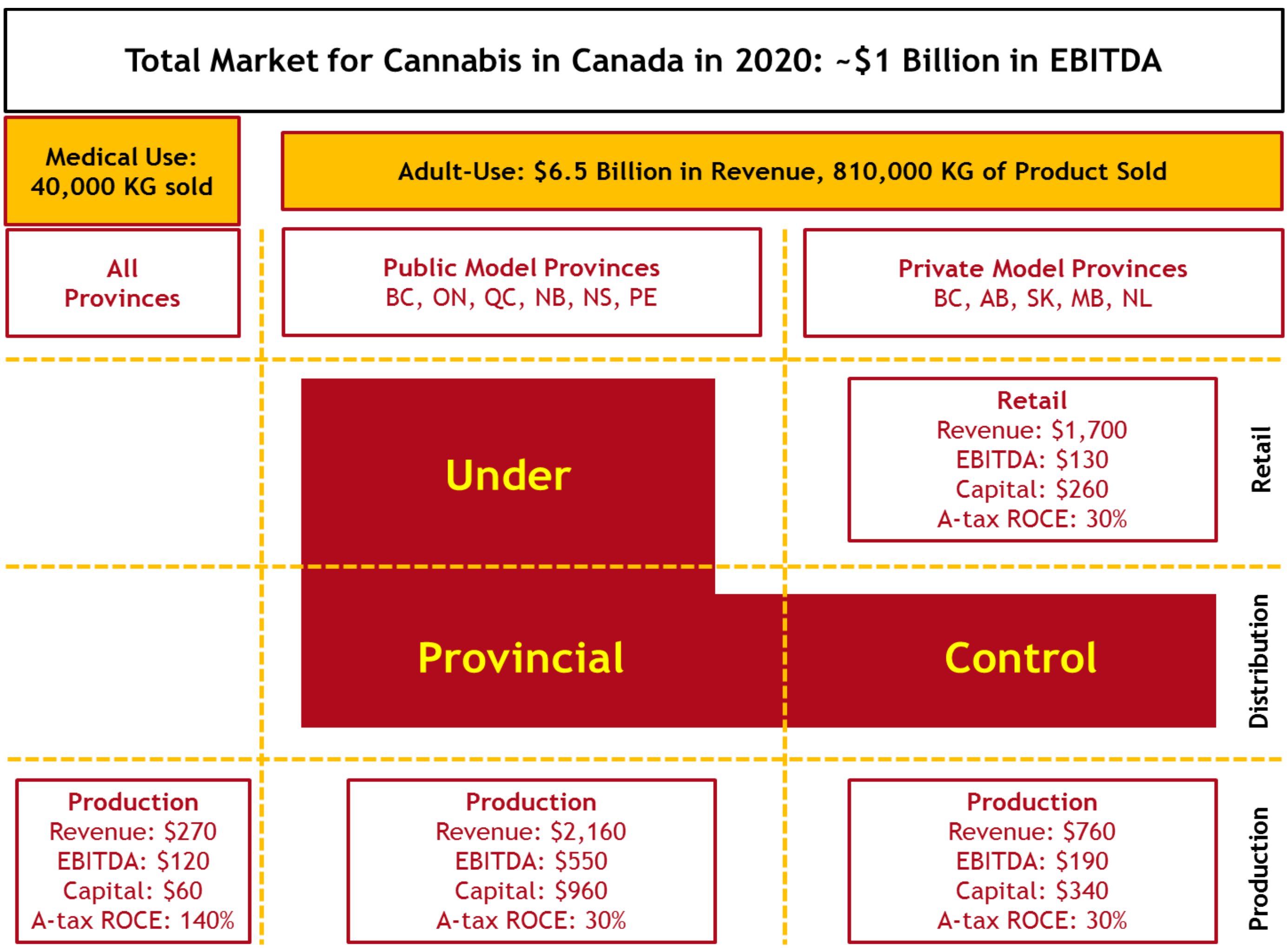
We note the following as the most important takeaways from an assessment of this burgeoning industry:

- The bulk of the value generated from this industry will accrue to Canada’s provinces. In fact, **we estimate that provinces will generate over $3 billion of income**, either in the form of earned profits or taxation revenues. While there are surely to be some incremental costs incurred, we believe these to be relatively modest. Public revenue-generating opportunities like this come along once in a lifetime, and **though provinces may claim otherwise, they are the big winners of legalization**.
- Producers will at some stage – likely sooner than many market participants may think - be sorted into the **haves and have-nots**. Construction and production promises in this industry are a dime-a-dozen, and while branding will play a meaningful role, **those with product ready to go, production capacity already built, and supply arrangements in hand can jump out to a sizeable lead, in our opinion**.
- **M&A will likely continue at a frenetic pace**, as producers flush with cash look to quickly increase capacity or to acquire medical expertise, distribution channels or international exposure. Meanwhile, retailers may wish to combine with producers to share knowledge or attempt to develop some semblance of vertical integration, though regulations make this challenging.

- Retailers will have materially less profit available to them than in a vertically-integrated world, as the provinces can essentially set a ceiling on the retailers' EBITDA margins through the wholesale model in which cost-of-goods pricing is regulated. That said, **stores are relatively inexpensive to build, licenses are in limited supply, and manageable operating costs still make this an attractive business to be in**, with potential after-tax returns on capital of ~20%.
- The sector **currently trades at an EV/EBITDA multiple of ~21x our 2020 industry forecast** (though this includes no contribution from international sales, which could prove very meaningful). Consistent with the development of other transformational industries in history, we believe that while many players currently exist, only a select few will become industry titans.

We do not intend to present ourselves as ultimate authorities on this subject and view those who do proclaim to be savants as foolhardy. But this report provides an in-depth assessment of the cannabis value chain, and should serve as a critical tool for investors looking to gain exposure to a new investment opportunity. Opinions diverge on so many subjects in the cannabis realm, and there seems to be just one conclusion that most everyone can agree on: witnessing the development of this industry will be fascinating to watch.

Exhibit 1. The Big Picture



All figures in millions of dollars unless noted otherwise

Source: CIBC World Markets Inc.

Market Overview: How Did We Get Here?

The changes that are under way closely mirror the process that alcohol went through after prohibition ended in the 1920s: liquor regained social acceptance and the product proliferated. Consumers were openly enjoying alcohol without fear of judgment from others, nor consequences from the long arm of the law. It can be argued that the source of cannabis' illegality is also quite suspect, mired in a history of anti-immigration, xenophobic tendencies, and competing interests looking to keep hemp from becoming a competitor to the pulp industry.

Prohibition's benefits are scarce, but the costs are well-known: misdirected police priorities, tied-up courts, the creation of criminal records for otherwise law-abiding citizens, and **potentially billions of dollars of forgone tax revenues** essentially gifted to black-market dealers.

Despite calls from various camps to push back the legalization date, as well as a nervous Senate vote, the federal government has (mostly) held its ground. The July 1 date had always been questionable (what politician wants to associate Canada Day with Cannabis Day?) but it appears that the stage is set for August or September to begin the experiment of a generation.

State Of The Dominion

It was only in 2015 that the federal Liberal platform on cannabis was announced: "to ensure that we keep marijuana out of the hands of children, and the profits out of the hands of criminals, **we will legalize, regulate and restrict access to marijuana**". Since then, the government created a fact-finding task force, and the recommendations it has made to ministers across the country have largely been followed.

To see how 2015 evolved, we must briefly trace a few other critical steps. Courts sided in favour of medical cannabis in 2001, ruling that those suffering from ailments like epilepsy, AIDS or cancer had a constitutional right to use the product. Health ministers controlled the market, selling cannabis for $5/gram, with just one company (Prairie Plant Systems) acting as sole supplier.

Stephen Harper's Conservatives took control of Parliament Hill in 2006, and though his party's view of drugs veered sharply to the right, they couldn't fight the Supreme Court and, as such, chose to privatize the industry. In April 2014, the existing *Marihuana Medical Access Regulations* (MMAR) was replaced by the *Marihuana for Medical Purposes Regulations* (MMPR), and 25 closely regulated private firms could now offer medical patients access to cannabis. Prices were liberated. Patients ordered different strains online and had product shipped to their door, an elegant solution for medical users. The MMPR system was relatively short-lived, and was replaced by the *Access to Cannabis for Medical Purposes Regulations* (ACMPR) in August 2016, chiefly because courts ruled that patients should be able to grow their own cannabis. Today, there are nearly 270,000 medical registrations resulting in over 5,000 kg of dried cannabis or cannabis oil every month, which projects to over 60,000 kg per year.

But walking through history focuses purely on the legal, medical access to cannabis. **This is a drop in the bucket compared to illicit purchases**. As we explore in the "Demand" section of our report, StatsCan estimates that Canadians currently consume nearly 800,000 kg of cannabis every year, and this figure has been increasing by around 4%/year over the past decade. Putting legality aside, a report from the UN claims that this country has one of the highest usage rates worldwide, estimated at 12.6% (a recent StatsCan survey quoted 14%). This is well above the global average of about 4%, though as in all regards in this industry, data quality is imperfect; furthermore, brutal penalties in parts of the world likely suppress what would be a higher number.

As the country approaches legalization, the provinces have begun to announce various pieces of their plans for legalization. There is much to be sorted out: licensing, zoning, involvement by pharmacies, product differentiation, and eventually regulation of other products, but in many regards, the stage is set.

Exhibit 2. National Cannabis Marketplace

	Retail - Online	Retail - Brick & Mortar	Distribution	Minimum age
BC	Public	Public & Private	Government-run	19
Alberta	Public	Private	Government-run	18
Saskatchewan	Private	Private	Government-run	19
Manitoba	Private	Private	Government-run	19
Ontario	Public	Public	Government-run	19
Quebec	Public	Public	Government-run	18
New Brunswick	Public	Public	Government-run	19
Newfoundland	Public, at first	Private	Government-run	19
Nova Scotia	Public	Public	Government-run	19
PEI	Public	Public	Government-run	19

Source: CIBC World Markets Inc.

The provinces will hold all the cards when it comes to distribution. This ostensibly is to safeguard product quality and security, which are reasonable enough goals. But it also provides the benefit of ensuring a significant level of profits flow to the provinces. In fact, we estimate that **provincial governments will capture a stunning 70% of industry profits**.

We concede that this does not account for increased investment related to prevention efforts, education, enforcement and other costs. But we don't believe these expenses to be as incremental (or as necessary) as the provinces seem to indicate, nor anywhere near the magnitude that is being suggested. The state of Washington, for example, generated $319 million of taxes and license fees related to cannabis last year. Its licensing, enforcement and general expenses? Just $42 million. And Washington uses a business model in which the state does not control distribution, unlike in Canada, where distribution will be the biggest source of the provinces' profits. A majority of Canadians – cannabis patients, libertarians, and a great deal of Average Joes - will celebrate this summer, but it is the provinces who will be laughing all the way to the bank.

State Of The Union

The path to legalization of cannabis in parts of the U.S. began during the Obama presidency, when the goal of America's federal prosecutors shifted significantly to a host of other, more important priorities.

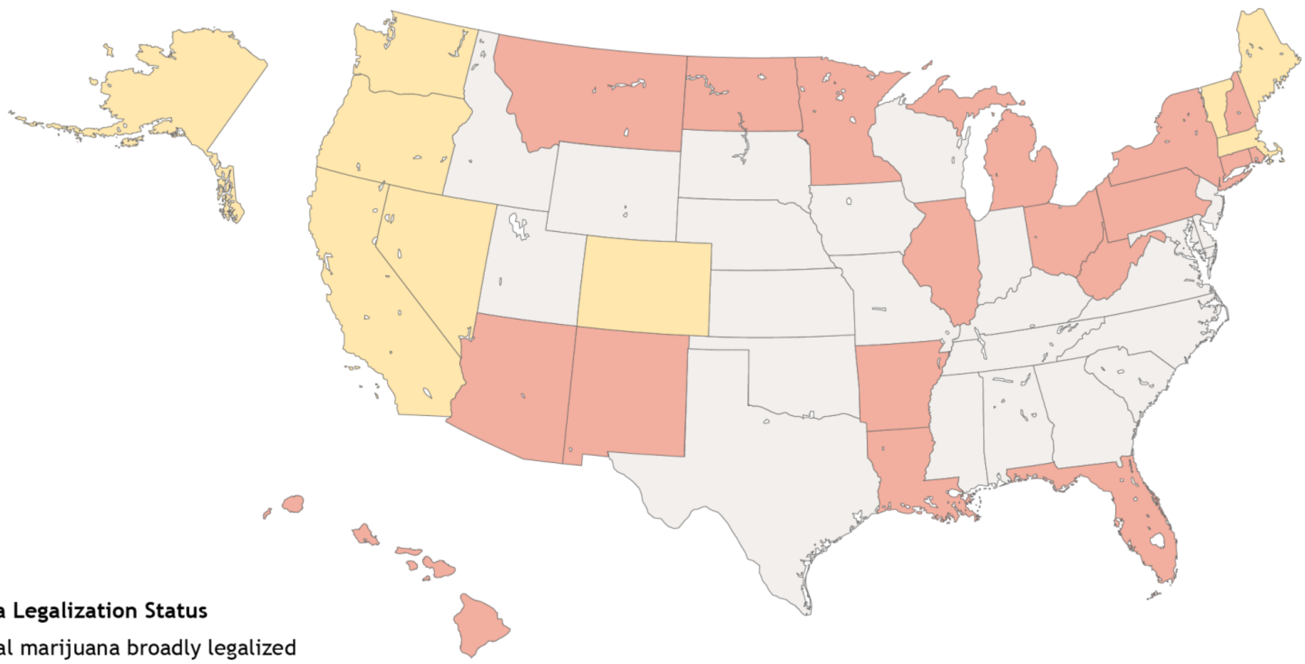
In October 2009, Deputy Attorney General David Ogden issued what is known as the **Ogden Memo**, which directed prosecutors to "not focus federal resources…on individuals whose actions are in clear and unambiguous compliance with existing state laws providing for the use of medical use of marijuana", thus opening the door to the acceptance of medical marijuana.

Following votes in Colorado and Washington to allow the recreational use of cannabis, the 2013 memo from Deputy Attorney General James Cole took the liberalization efforts further. **The Cole Memo suggested that the priorities of law enforcement should be concerns such as preventing distribution to minors, elimination of cartels and organized criminal enterprise, and reduction of drugged driving, among other goals**. The directives from Ogden and Cole were supported in Congress by the Rohrabacher-Blumenauer amendment in 2014 (now renewed annually), which prevented the Justice Department from allocating funds to interfere with the states' implementation of medical cannabis laws.

Legalization efforts immediately hit the pause button following the surprise outcome of America's 2016 Presidential election. On January 4 this year (and just days following recreational legalization in California, coincidentally enough), Attorney General Jeff Sessions rescinded the memos issued during the Obama administration, suggesting the shift was "a return to the rule of law". The directive from Sessions, much like the prior memos, conceded that law enforcement and prosecutors have finite resources, but came to a very different conclusion than that of Ogden and Cole. **Federal laws continue to classify cannabis as a Schedule 1 drug, putting it in the same camp as heroin, and more dangerous than methamphetamine, cocaine, and even fentanyl**.

That said, the Sessions memo did not explicitly advocate for more prosecutions, and so America continues to remain in legal quagmire, even as 29 states (consisting of over 60% of the population) allow cannabis use in either recreational or medical form.

Exhibit 3. U.S. Legal Status Of Cannabis, By State



Marijuana Legalization Status

- Medical marijuana broadly legalized
- Marijuana legalized for recreational use
- No broad laws legalizing marijuana

Source: governing.com and CIBC World Markets Inc.

The issues created by this confusing legal status are not just felt by medical patients or casual users. Businesses that seek to be entirely legitimate, and those that wish to pay employees, payroll taxes, income taxes, property taxes and other levies like any other company must conduct business using armoured vans and security guards with firearms. They are unable to procure basic banking services, and in some cases, cannot even deduct business expenses, essentially forced to pay tax on revenue rather than profits.

One advantage for Canadian regulators is that there is some data flowing out of early-adopter states like Colorado and Washington. Notably, one chief fear— increased usage among youths— has seemingly been rebuked, as Colorado teens are using less cannabis than they were prior to legalization, down from 12% to 9%. The same goes for Washington, whose cannabis usage rate among teens has remained unchanged since legalization occurred.

On the economics front, proliferation of the free market has caused—after brief product shortages and price spikes— significant price declines. The wholesale price of a pound of cannabis in Colorado dropped from a peak of US$2,000 in January 2015 to US$1,300 late last year, according to *The Economist*. This has impacted the black market as state officials had hoped: border seizures are down dramatically, as cartels lose share (black market cannabis is viewed to be rather inferior to that which is grown by locals, anyway).

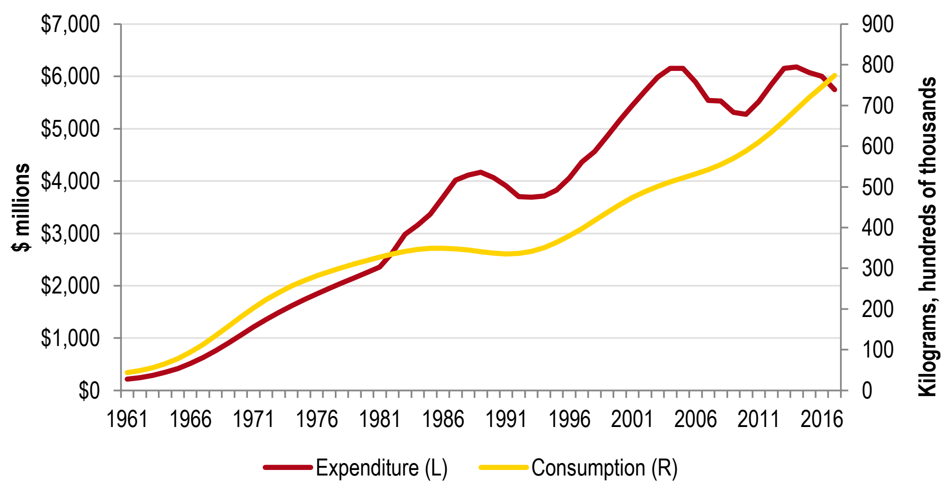
Interestingly, despite the increased legality south of the border, capital continues to flow in Canada. American firms like iAnthus Capital have come to Canada to raise equity, as doing so at home remains a challenge. The company's co-founder decided to head north not because he likes the climate, but rather "it's like what John Dillinger said when asked about why he robbed banks: that's where the money is".

Supply & Demand

Demand

According to Statistics Canada, **"in 2017, about 4.9 million Canadians aged 15 to 64 spent an estimated $5.7 billion on cannabis for medical and non-medical purposes."** Pricing is somewhat volatile, but the chart below that depicts Canadians' consumption of marijuana suggests usage has grown by over 5%/year since the early 1960s, outpacing population growth by nearly 400 bps.

Exhibit 4. Canada's Cannabis Demand Profile

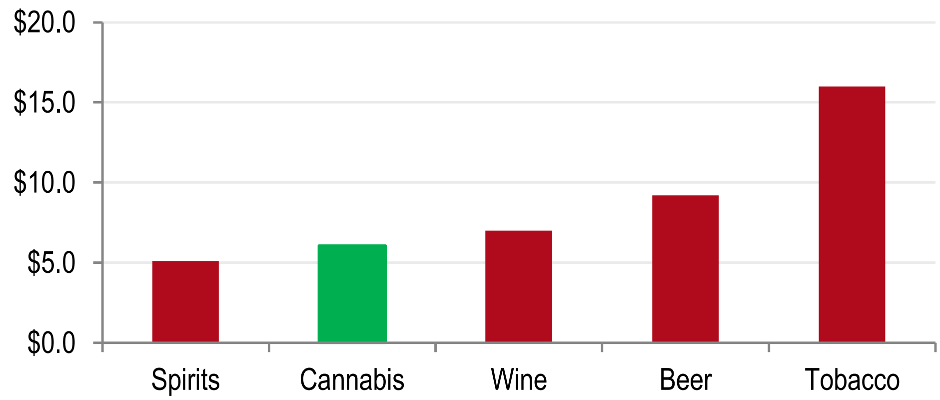


Source: Statistics Canada and CIBC World Markets Inc.

Some other interesting highlights from StatsCan's recent findings on the subject:

- The cannabis market has experienced price deflation the past few years. As growing methods have become more sophisticated, and the social stigma of use has declined, **prices haven't been this low since 1981**.
- The nearly $6 billion spent on cannabis last year compares to $16 billion worth of tobacco purchases; $9.2 billion on beer, $7 billion on wine, and $5.1 billion on spirits.

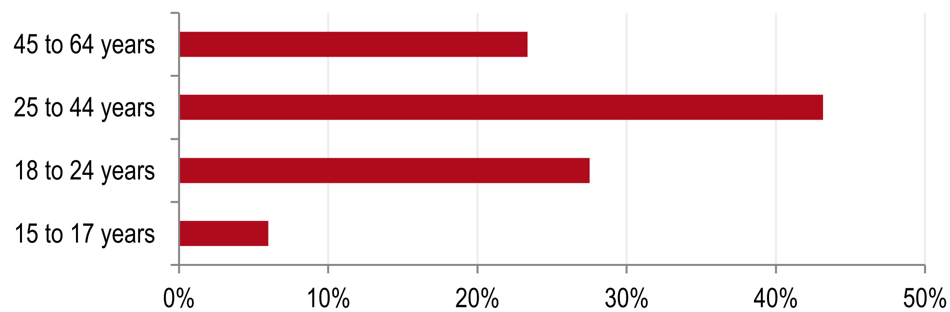
Exhibit 5. Bigger Than Spirits - Total Sales By Product ($ billion)



Source: Statistics Canada and CIBC World Markets Inc.

- While tobacco sales were ~3x those of cannabis, much of the tobacco sold here is produced elsewhere. **Domestic cannabis production exceeded that of both tobacco and beer.**
- Users are predominantly in the 25-44 age bracket (nearly 45%), though the product has appeal at all ages.

Exhibit 6. Users' Distribution By Age

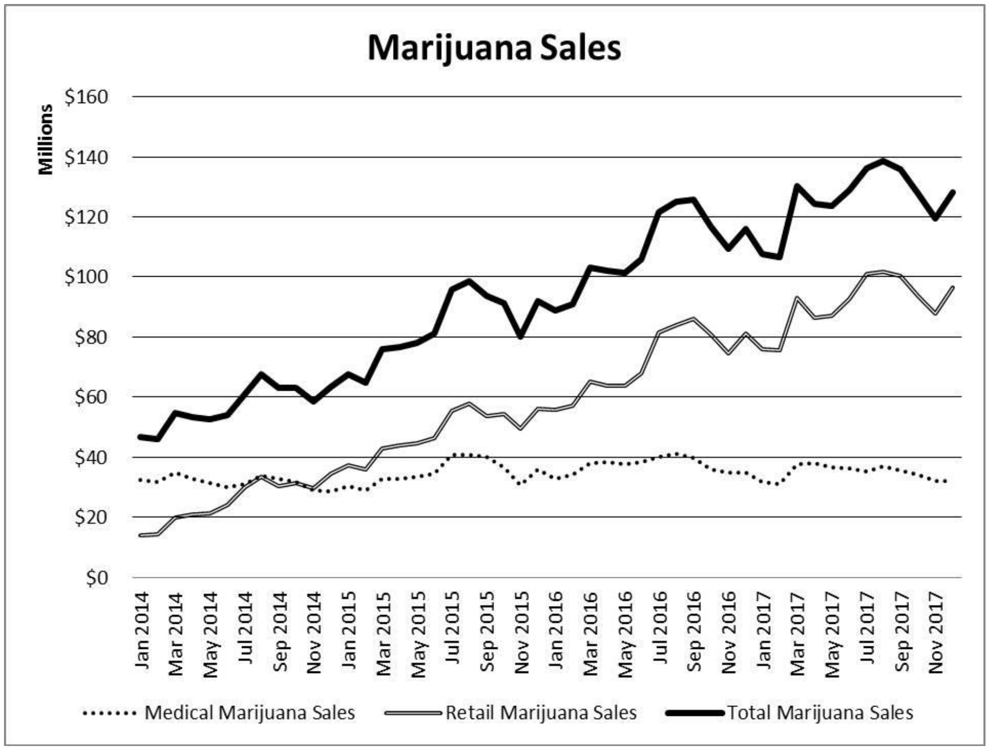


Source: Statistics Canada and CIBC World Markets Inc.

Imperfect data aside, it is impressive from an industry bull's point of view that consumption has grown at a CAGR of +5.3% since the 1960s, while total expenditure has grown +6%/year over that time.

When trying to predict the future, we look to Colorado's experience. The first state to legalize cannabis on an adult-use basis has seen sales increase by a CAGR of over 30% since the start of 2014; interestingly, medical cannabis sales have barely budged, despite tax-exempt status.

Exhibit 7. Colorado's Experience



Source: Colorado Department of Revenue

The data paints a similar picture in Washington, another early adopter. Sales were remarkably sluggish in 2014, as a combination of regulatory hiccups, unprepared municipalities, a byzantine tax structure, and sky-high prices meant consumers did not change their habits. But this has now largely reversed, and both markets are extremely lucrative. To put this in perspective, **the combined populations of Washington and Colorado are less than that of Ontario, yet these two states combine for nearly $3 billion in sales, and over $650 million of annual revenue from taxes, licenses and fees**.

Exhibit 8. Adult-use Cannabis Figures In Select U.S. States (US$ million)

	2014	2015	2016	2017
Washington - sales	$49	$486	$1,109	$1,474
Washington - taxes, licenses & fees	$16	$129	$256	$340
Colorado - sales	$683	$996	$1,307	$1,508
Colorado - taxes, licenses & fees	$2	$66	$189	$319

Source: Colorado Department of Revenue, Washington State Liquor and Cannabis Board

No wonder, then, that Canadian provinces, despite reminding anyone and everyone of what they believe to be much higher costs, are eager to keep very tight control of the product.

Exhibit 9. History Lesson: The Path To $6.6 Billion

	Colorado	Washington	**Canada (CIBC est.)**
Initial capture rate from black market (est.)	50%	20%	50%
Year 1 growth rate	46%	202%	50%
Year 2 growth rate	31%	75%	40%

Total kg sold, 2017 (StatsCan)	773.3
2018 estimate	804.5
Estimated capture rate from illicit markets	**50%**
Kg sold through legal channels	402.3
Year 1 growth rate	50%
2019 kg sold through legal channels	603.4
Year 2 growth rate	40%
2020 kg sold through legal channels	844.7
Less: medical consumption	37.9
2020 kg sold through legal channels, adult-use	**806.8**
Average price per gram or gram equivalent	$8.00
Total adult-use sales (rounded)	**$6,500**

Source: CIBC World Markets Inc.

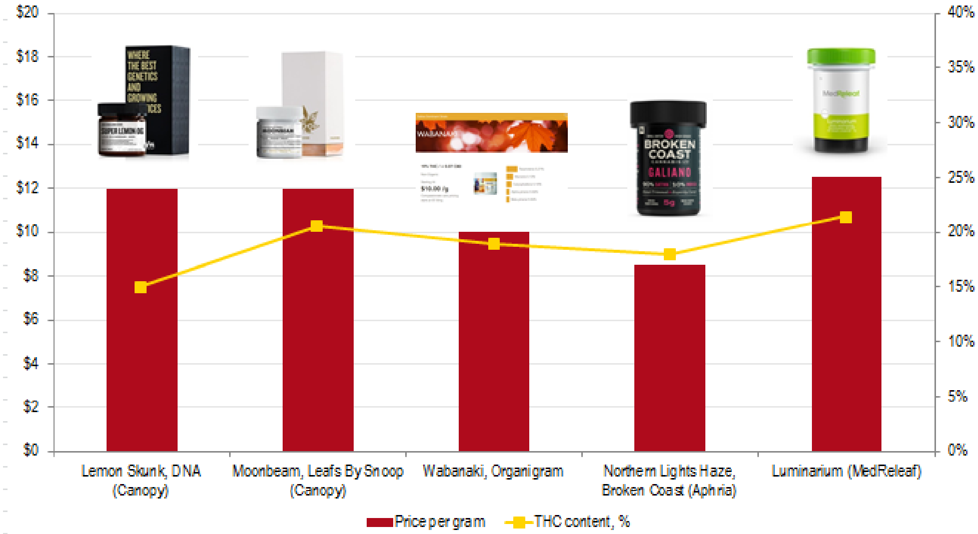
How Much Will Brands Matter?

Producers are wagering that consumers will develop brand loyalty, even while experimenting with different cannabis-based products. This subject—product breadth—probably does not gain enough attention among all the media coverage on cannabis.

There are all types of cannabis-based products available: dried flower, pre-rolls, oils, capsules, consumables like beverages, candies, cookies, and many more. And products can appeal to consumers in many ways. For consumables, taste is obviously critical, and for flower, the tetrahydrocannabinol (THC) and cannabidiol (CBD) content are important, but terpenes, appearance and of course price all matter too. As always, it's the tastes and preferences of the consumer that determine which product they choose. Those who seek assistance with insomnia may wish to use cannabis that is higher in the terpene known as myrcene, while someone attending a concert could opt for candy that includes a cannabis strain with the terpene limonene.

To demonstrate just a sample of the variety available, the chart below displays select sativa strains among the various Licensed Producers (LPs), including their price and THC content.

Exhibit 10. Select Sativa Strains Among LPs



Source: Company websites and CIBC World Markets Inc.

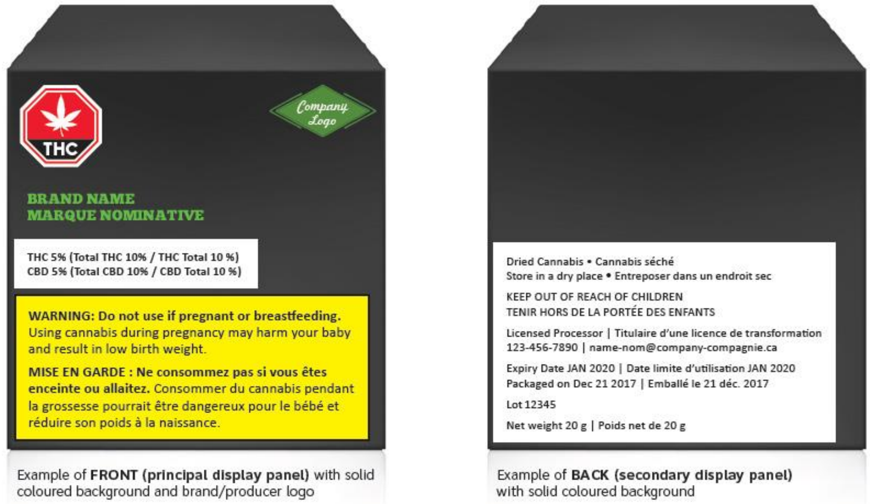
We find the matter of branding to be the biggest question mark of the entire cannabis legalization process. Once again, we look to two other controlled products—alcohol and tobacco—to guide our view. And it is important to place brand loyalty on a continuum rather than viewing it in binary terms.

For alcohol producers, there is significant brand loyalty, although one could argue that product preference plays a greater role than actual brand. For example, wine drinkers likely have a favourite brand, but the key for many consumers is to find **any** cabernet sauvignon rather than their favourite brand of cab sauv. The same can probably be said of beer, though spirits may have greater brand loyalty. Tobacco is a trickier product to assess. We would suggest that consumers are very loyal to brands like Marlboro or Newport, but the increased addictive properties of the product make it harder to compare.

One area where we have more conviction is increasing use of online product reviews. In this regard, cannabis is no different from other consumer goods, and people want products they can review. This places onus on LPs to produce strains that occasionally have silly names associated with them—Girl Scout Cookies or God Kush, for example (for some users, this is part of the enjoyment of the product)—but the advantage of this is that consumers can easily review them on international sites like leafly.com. For others, proprietary names like Midnight or Bedica can be seen as the private labels of the industry. They may have fewer reviews associated with them (though this is changing), but a lower price could mean consumers are quite happy to choose them.

To some extent, the ability to market to consumers depends on labelling and packaging, and on this front, cannabis producers will not have much leeway. The amount of aesthetic ability to distinguish a product will be vastly outpaced by the product warnings, as shown below.

Exhibit 11. (Don't) Express Yourself



Source: Health Canada.

While differentiation will be more difficult than in the alcohol world, we still believe that a meaningful segment of **consumers will have favourite brands and that winners will not solely be determined by who has the lowest-cost production or lowest pricing**. This is particularly true in the consumables segment—once it is legalized, likely late next year—but is also potentially true of other products like vaping oils. In our store visits in markets where adult-use is legal, we learned that certain edibles brands have significant popularity among consumers, and we suspect Canada will be no different.

The biggest determinant may have little to do with brands, though. Post-legalization demand may at first outstrip supply (as we explore in the section below), and in that case, **whoever actually can be the first to put their products on shelves could get a head start on winning customers' loyalty**.

Demand For Medical Cannabis In Canada

Please see the Appendix for a complete review of medical cannabis in Canada.

The size of the Canadian medical cannabis market is difficult to measure accurately because there are no validated sources of user data, and each of the current sources has limitations when interpreting them. For example, although Health Canada has a register of patients, there appears to be a sizeable pool of current cannabis users who claim to be using for medical reasons, yet are not captured on the Health Canada register. The government's own survey reported that 71% of respondents who said they used cannabis for medical purposes did not have a medical document from a healthcare professional (not registered). Regardless of what the medical market size is, we believe it will be dwarfed by the recreational market.

Growth In ACMPR Does Not Reflect True Patient Numbers

The official medicinal cannabis market appears to have grown quickly over the last three years, with the number of patient registrations at Health Canada having increased by ~1,500% in that time frame. Sales of dried medical cannabis have grown by a CAGR of ~167%; however, we question the number of registered patients at Health Canada as an accurate estimate of the number of people using cannabis for medical purposes. The real growth in patient registrations started with the Liberal government's actions to legalize recreational use that started in 2016, which calls into question the real catalyst(s) behind the huge rise in registrations. We may never really know the answer.

We also caution that "active registrations" does not refer to the number of individuals registered, as Canadians can have more than one active registration at a time. Another factor that has contributed to the rise in patient registrations is the fact that LPs have provided incentives to cannabis clinics to recruit patients.

We forecast the Canadian medical cannabis market to be ~$267 million by 2020, an increase of ~42% from our 2017 estimate of $188 million. Key assumptions behind our forecast are as follows:

1. **We assume that the ACMPR patient numbers contain duplications**. Our reservations with this database notwithstanding, the ACMPR appears to be the only real source of patient data available. In theory, the current usage of legal cannabis should be derived from ACMPR registered users. Health Canada projects the number of registered patients will reach 450,000 in 2024, an annual growth rate of ~8.5%. However, we assume a 7% growth rate off a lower base of ~113,000 in 2017, and thus reach ~181,000 in 2024. The rationale for the lower base is that we believe there are many patients who are registered more than once in the ACMPR, perhaps to ensure supply from more than one LP.
2. **Dosing is highly individualized, but we estimate average usage of 0.75g/day**. Due to the idiosyncratic nature of the effects of cannabis, physician experts recommend a very cautious approach to the use of cannabis for medical purposes, with most indicating 1-2g/day as a reasonable amount for the vast majority of cases. Health Canada reports that the average Canadian patient is authorized 2.4 g/day, but actual daily usage for medical purposes varies, and is somewhere between 0.5g and 1g per day. For reference, Israel's average use of medical cannabis is 1.5 g/day, while in the Netherlands it is 0.7 g/day.
3. **Average price per gram will decline over time.** With the expectation of added cultivation capacity, we expect the initial supply constraints to dissipate post-legalization, and thus prices to erode over time, especially in the direct-to-patient model currently in place, in which LPs capture much higher margins. The price used in our forecast does not include excise/sales taxes, which are expected to be levied equally on both medical and recreational use for any products with more than just traces of THC. Since we view reimbursement as slow to evolve, this is another reason to believe pricing is not likely to increase. We also believe there will be patient pressure to keep the price of medical cannabis at a slight discount to equivalent product in the recreational market.

Exhibit 12. Canadian Medical Demand Forecast & Sensitivity

	2017E	2018E	2019E	2020E
Estimated # of Legal Medical Cannabis Patients	112,982	120,891	129,354	138,408
Average Consumption (g/day)	0.75	0.75	0.75	0.75
Estimated Consumption By Patients (kg/year)	25,078	33,094	35,411	37,889
Average Price Per gram (C$)	$ 7.50	$ 7.35	$ 7.20	$ 7.06
Est. Total Revenue (C$ x 1000)	**188,087**	**243,240**	**255,062**	**267,458**

Average Price (per gram) vs. Average Consumption (g/day)

	$ 5.00	**$ 6.00**	**$ 7.00**	**$ 8.00**	**$ 9.00**	**$ 10.00**
0.25	63,149	75,779	88,408	101,038	113,668	126,298
0.50	126,298	151,557	176,817	202,076	227,336	252,595
0.75	189,446	227,336	265,225	303,114	341,003	378,893
1.00	252,595	303,114	353,633	404,152	454,671	505,190
1.25	315,744	378,893	442,041	505,190	568,339	631,488
1.50	378,893	454,671	530,450	606,228	682,007	757,785

Source: CIBC World Markets Inc.

Supply

We believe significant barriers to entry currently exist in this industry, but that's not the immediate conclusion upon learning that over 100 LPs exist countrywide. Waiting times for Health Canada inspections and approvals to obtain separate licences for cultivation and sale have been an issue in the past, and ascertaining the knowledge required to build massive facilities is remarkably challenging. But there appears to have been no shortage of capital to pay up for all the lessons learned, and so the market has proliferated with producers. The largest barrier now, however, might be a path to the marketplace.

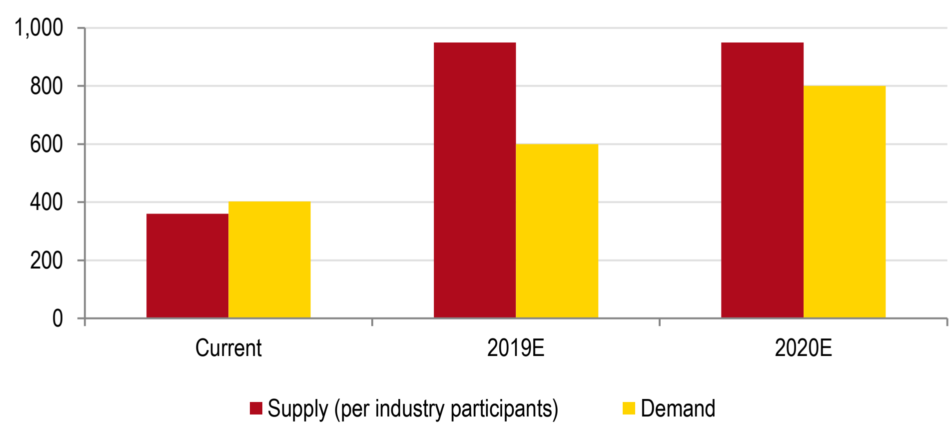
What Happens In August (Or September, Or October)?

We expect the supply developments in Colorado to repeat in Canada. That state experienced supply challenges at first, only to see a boom in production, followed by a significant decrease in wholesale prices, eventually culminating in a market equilibrium. Our expectation is that the process will be a textbook experiment in economics.

By our count, the current production capacity among LPs is roughly 350,000 kg/year, with the largest six players (Canopy, Aphria, Aurora, CannTrust, MedReleaf and Organigram) combining for over 90% of that figure. This is more than enough to supply the current medical demand, but **it's also nowhere near enough to supply an adult-use market**. In fact, Aphria CEO Vic Neufeld said on the company's Q3 earnings call that "unless someone's out there hiding 100,000 KGs, we're looking at a real shortfall".

Where the supply question gets interesting is in analyzing the LPs' production plans. It's challenging to put an exact figure on it, but we would estimate that combining current production capacity with in-progress construction projects yields over 1,000,000 kg, which is well above what we estimate will be Canada's adult-use market. In fact, **even if the market share of illicit dealers goes to zero, the current <u>plans</u> in place will vastly exceed demand**. This suggests two critical questions that investors must ask. First, when assessing LPs' plans, how quickly will current expansion arrangements be executed? And second, will investors still fund future development proposals once sufficient capacity exists and distribution channels are already filled?

Exhibit 13. Demand & Supply Forecasts



Source: CIBC World Markets Inc.

Weed, Weed Everywhere, But Not A Leaf To Smoke

The conclusion from the chart above may be that no province will have any issues sourcing supply once legalization rolls around, but this couldn't be further from the truth, in our opinion. The 700,000 kg capacity increase set for 2019 may not be entirely ready until the end of that year, and even that could be aggressive. Construction overruns are incredibly common, but even if projects are completed on time, it still takes months to actually produce shelf-ready products.

We believe the legitimate market will be underserved upon legalization, and it will be those LPs who actually have product on hand as well as production capacity—not just ones with grandiose plans—who have the opportunity to win a first-mover advantage and gain the ability to develop relationships with distributors, retailers and customers. This is not to say producers cannot be late to the game, but we believe they will certainly be playing from behind.

Too Much Of A Good Thing?

LPs can be commended for having such grand ambitions to supply over 1 million kilos of cannabis. It's almost certainly more than this country will need, but that doesn't mean it will go to waste. Producers are rapidly signing exporting deals with other countries where production facilities trail those of Canadian competitors. It's impossible to say whether international demand will pick up all this slack, but it at least should make a dent. We assess the international prospects for cannabis on page 29.

It's worth emphasizing, however, that we suspect some of the jobs that are "in progress" likely won't ever see the light of day. It's our view that for producers who are only now getting started, they probably will not secure supply agreements with buyers, and the capital required to complete these projects will disappear.

Economics: Pricing And Distribution

The cannabis industry is in its infancy in Canada, but the history of government oversight of controlled products is extensive. Our approach to forecasting how the industry develops involves a separation into three segments. We begin our analysis with the licensed producers, who will serve both the medical and adult-use markets. Next, we attempt to understand and quantify distribution. Our basis for this analysis is to use the framework of the existing provincial approach to distributing alcohol. Finally, we assess the economics of retailing in Canada.

In each section, we provide our predictions, as well as a series of ***Key Questions*** and ***What If?'s*** along the way.

Production

There are now four LPs who generated at least $10 million of revenue in their most recent quarter. In the existing medical market, the producers' gross margins are quite attractive. In the table below, we have attempted to show, on a like-for-like basis, the proceeds and costs on a per-gram basis (or gram equivalent, for oil-based products) for the LPs. This is admittedly a challenging exercise: different companies report their "cash costs" in different ways, and fair value adjustments required by IFRS standards don't make things easier. But we have attempted to include any cash costs associated with growing, including oil conversion, quality control, indirect labour, and costs of packaging and labelling as well. We have attempted to exclude shipping costs, as the distribution mechanism upon legalization of adult-use will be completely different than today's ship-to-home model. With that said, we present below **our estimates of the LPs' gross margins, which seem to average over 80%, as a result of rapidly declining per-gram costs.**

Exhibit 14. Company-specific Metrics (CIBC estimates, based on most recently reported quarter)

	Revenue ($MM)	KG sold	Price / g (excl. wholesale)	Cash cost / g	Gross margin
Aphria	$10,267	1,428	$8.30	$1.65	80.1%
Aurora	$11,700	1,162	$8.36	$1.82	78.2%
Canopy	$21,700	2,330	$8.30	$1.53	81.6%
MedReleaf	$11,350	1,263	$8.98	$1.44	84.0%

Source: Company reports and CIBC World Markets Inc.

Today's business model has limited value in predicting the adult-use cannabis world. Medical patients will likely—for now—continue to buy directly from LPs; on this front, nothing changes. The adult-use market, however, will have significant intermediaries between LP and the consumer.

Key Question: What Price Will Distributors Pay To Producers?

We already have some insight into wholesale pricing. One LP, Aphria, currently has a wholesale practice in place (it has recently halted this in order to build inventory to prepare for legalization), since its production capacity exceeds its direct customers' demand. Though not published, it can be deduced that APH sells its cannabis at a wholesale price of ~$4.75/g (versus its retail price of $8.30/g). This leads to a **wholesale gross margin of about 65%.**

Exhibit 15. Aphria's Estimated Wholesale Gross Margin

Wholesale price / g	$4.75
Cash costs / g, "all-in"	$1.65
GM $	$3.10
GM %	**65.3%**

Source: Company reports and CIBC World Markets Inc.

In our view, this is the best starting point for how LP economics will look in an adult-use world. However, two points are worth noting. First, as identified previously, provincial governments will serve as somewhat of a monopsony, and we believe **large, powerful buyers will push this wholesale price down**. And second, the LPs' margins can climb over time due to the production of higher-value-added products such as oils, gel capsules, and eventually, consumables like beverages and candy. Anecdotally, and confirmed through our travels, dried flower continues to be the most popular product, but edibles and oils are quickly gaining. We will wait to see greater development of the market before attempting to quantify the impact of margin expansion, but the conclusion at this stage is that it is certainly positive for producers.

What If? Faced with demand even above the highest forecasts, provincial governments on the hook for distribution try to outbid one another in a desperate attempt to source finite supply. Wholesale prices soar, and one lucky LP is the first to reach a $10 billion valuation.

What If? The provinces attempt to use their pricing power to capture a greater share of cannabis profits. Supply shortages exist at first, but provinces hold their ground, imbalances correct, and soon buyers hold all leverage, bringing LPs' gross margins down to below 50%.

Our Take. Squeezing the LPs too much will allow illicit markets to proliferate. Furthermore, the Liquor Control Board of Ontario (LCBO) is one of the world's largest buyers of alcohol, but numerous articles suggest that its buying practices leave much to be desired. Also, taking too much from LPs would push out smaller providers, and both the Federal Cannabis Task Force and consumers have made their preference known for smaller growers to play a role in this industry.

Producer cost: $1.50/g

Producer revenue: $3.60/g

We believe the assumption of a **~60% gross margin, or 140% product markup, for LPs is a reasonable one.** Assuming cash costs continue to decline, and hit $1.50/g industry-wide, **producers capture $3.60/g in revenue, on average, from government buyers**.

Distribution

We see little reason to suggest that this industry will be materially different from that of alcohol. Remember that like in alcohol, the provinces will control selling prices and will be the single wholesale buyer, i.e. an identical structure to what we will see in cannabis distribution. With that in mind, there are two frameworks—Alberta and Ontario—currently in place that act as excellent archetypes for the future of cannabis distribution in this country.

Alberta's liquor market involves the province acting only as distributor, while allowing the retail market to be served by private competitors. Alberta, Saskatchewan, Manitoba and Newfoundland will use this model for selling cannabis (BC is using a hybrid model).

As a distributor, the Alberta Gaming and Liquor Corporation (AGLC) functions quite well. Retailers buy from either the AGLC or one of its authorized manufacturers, with the AGLC imposing a flat markup along the way.

In Ontario, and nearly every other province in the country, the province acts as both distributor as well as retailer. Ontario, Quebec, New Brunswick, Nova Scotia and PEI have chosen to implement this model for cannabis.

The difference between the two is best exemplified by looking at the annual reports of each of the AGLC and the LCBO. Interestingly, the product markup for the LCBO is ~2x that of the AGLC, demonstrating that each function—distribution and retail—gets a similar share of the final before-tax price paid by the public. From a conceptual standpoint, the conclusion is clear: a monopoly either in wholesale or retail generates ~35% EBITDA margins.

Exhibit 16. Distributor Economics—Public Vs. Private

	LCBO	AGLC
Liquor revenue	**$5,572**	**$2,545**
COGS	$2,785	$1,668
Gross margin	**$2,787**	**$877**
GM %	50.0%	34.5%
Product markup	**100%**	**53%**
SG&A	$806	$39
SG&A %	14.5%	1.52%
EBITDA	**$1,981**	**$838**
EBITDA %	35.6%	32.9%

Source: LCBO, AGLC, and CIBC World Markets Inc.

Key Question: What Price Will Distributors Charge To Retailers?

- **What If?** The provinces, desperate for revenue to address infrastructure, health care, education and social programs, don't want to leave a penny on the table. The Federal Task Force may have stated a preference for craft growers, but it said no such thing about retailers. Afraid of looking like poor negotiators, **provinces charge double the price they paid the LPs**.
- **What If?** Provinces don't inherently care about higher prices for consumers, but plucking too many feathers from the goose, so to speak, risks being bested by illicit dealers. This could unravel into a very public mishandling of the cannabis opportunity, with the world looking to Canada in terms of "**how not to legalize cannabis**". In an embarrassing admission, governments concede they shouldn't be in the business of, well, business.

Our Take – Provincial negotiations will vary, but we believe margins will likely match that seen in alcohol, and will be approximately 35%. Some in the industry have speculated that provinces may take a more conservative, hands-off approach, but **we believe provinces will want to do better**.

Wholesale cost: $3.60/g

Wholesale revenue: $5.60/g

It's not every day that a new source of revenue shows up in provincial coffers, particularly one that seems to receive less pushback than income or property taxes. We suspect governments will be bold, and target a ~55% markup (or 35% margin) to the price they pay to the LPs. Prices are now up to $5.60/g.

Retailers

Having the state control the wholesale function of cannabis sales to some extent limits the potential profitability of the retail component. Jurisdictions like Colorado or Washington, for example, allow for vertical integration, and so businesses that control their supply chains can achieve far higher margins and thus much greater returns.

Our source for guidance on the retail element is Liquor Stores N.A. (LIQ), the only publicly traded alcohol seller in North America, whose liquor business in 2017 captured a ~26% gross margin and a four-wall EBITDA margin of ~8%. The 26% GM% implies a ~35% markup on their cost of alcohol, a useful proxy for cannabis.

We note that our analysis of retailers excludes the sale of cannabis accessories. Surely, these stores will sell vaporizers, papers, filters, pipes, and other items, but we have left this aside for now. The key to remember is that these products will boost margins and overall profits at retail stores, thus making them more attractive to operators than metrics on cannabis alone might suggest.

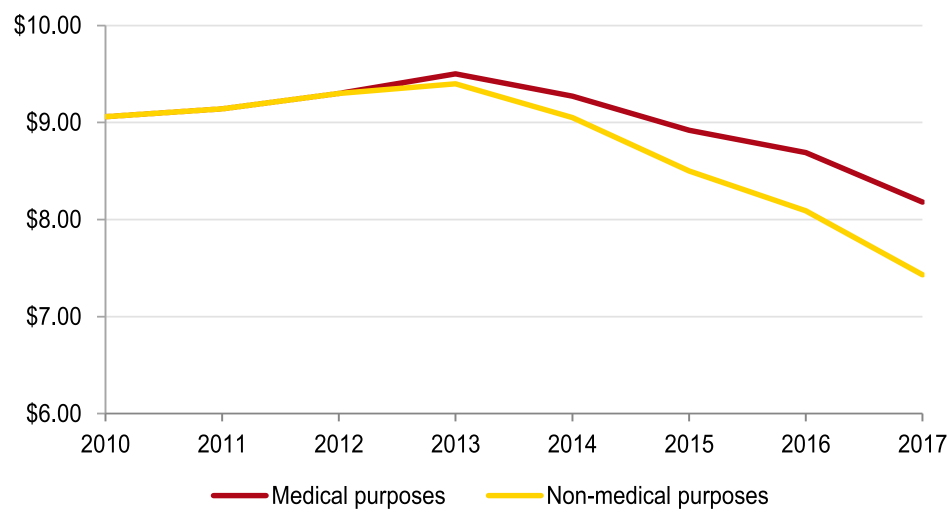
Key Question: What Price Will Retailers Charge?

The proper balance is well-known, but bears repeating: **set the price too high, and black market sellers will continue to capture profits; if prices are too low, governments can be accused of encouraging consumption**.

If five million Canadians are currently spending $6 billion on cannabis annually, then there is clearly an existing group of providers who are quite able to serve the market. Retailers who think $20/gram cannabis is attainable will quickly find consumers walking out of their stores, pulling out their phones, and DM-ing their previous dealer to see if they can still get that deal on Bruce Banner at $8/gram.

StatsCan suggests that Canadians pay $8.18/g for medical cannabis and $7.43/g for non-medical cannabis, and that these prices have fallen meaningfully over the past half-decade.

Exhibit 17. Cannabis Price History In Canada



Source: Statistics Canada and CIBC World Markets Inc.

To this point, regulators have played very few cards on the pricing front. Government officials and media sources have suggested that the approximate price of $10 per gram is a reasonable starting point. However, using the convenience of a round number as well as an anecdotal view of pricing ignores the fact that different products have different profiles.

It seems obvious to us that there cannot be one individual price for cannabis, the same way there is not one individual price for beer, wine, spirits or cigarettes. Fixed prices provide no incentive for producers to improve their product, the same way that rent controls do not encourage improvements to housing stock. Meanwhile, the idea of price floors has been suggested, but this immediately creates an opportunity for illicit markets. Our analysis simplifies the pricing element and uses a macro approach, but it is important to note that there will likely be a variety of prices in both public and private markets.

In our view, most Canadians are willing to pay a premium to existing prices to receive the benefits of easier access, input transparency, assured quality, and, for some, the knowledge that they are law-abiding citizens contributing to society (some may avoid buying from legal channels for exactly the opposite reason). There is value in a consumer being able to legally order their cannabis online, or to stroll into a store, have questions answered by an expert and pick up a variety of strains all in relatively short order, but we believe regulators must also acknowledge that many consumers will be price sensitive.

In Colorado, publicly available sources suggest that the price/gram initially climbed from about $7.50 (USD) up to nearly $11, but has since sunk back down closer to $7.50. In our store visits, we witnessed prices as low as $6/g (before tax) to as much as $30/g. Pricing gets even more complicated when factoring in volume discounts (which government sellers probably won't allow anyway). An ounce of flower (~28g) could be had for as little as $120 ($4.30/g) in some instances, and as much as $400 ($14.30/g) in others.

Data on cartels and illegal dealers is rare, but they appear to do remarkably well. This suggests that governments should err towards lower prices. Canada has relatively high use rates compared to other countries; we would venture a guess that legalization won't create a massive boom in demand. So the question to government becomes, which is the greater priority: the perception of discouraging use, or eliminating illicit activity?

What If? In an effort to completely snuff out black market dealers, provincial retailers impose price caps of $9/gram before excise taxes. The intention seems noble enough, but the reduction in incentives for producers means they undergo **rampant cost-cutting, and inferior products flood the market through official channels, leading customers to shun licensed stores**.

What If? Private retailers prioritize future profits and begin an all-out price war to capture customer loyalty. **Consumers can't get enough of the stuff, being offered prices as low as $6/g for high-quality product.** It turns out consumers aren't just enjoying more cannabis; in droves **they are substituting it for alcohol and tobacco**, whose lobbying groups cry foul at federal governments for encouraging greater consumption. Liquor and tobacco giants begin to buy and build their own cannabis facilities, racing to catch up to the existing LPs and bidding up asset prices to triple their current market caps.

Our Take – An average price of $8/g would enable retailers to achieve an approximate 30% gross margin, modestly higher than LIQ's current gross margin. This is probably a low enough price to keep customers from using illicit dealers, while high enough to encourage retailers to invest in creating a compelling customer experience. This adds another $2.40 to the customer's tally, **now at $8** with HST and excise tax still to be accounted for.

Retail cost: $5.60/g

Retail revenue: $8/g

Excise Taxes & HST

The taxation element will be the smallest contributor to the total cannabis price, but likely one that will irk consumers anyway. While laws are still making their way through the Senate, federal and provincial governments have agreed to an excise tax of $1/gram or 10% of the retail price, whichever is greater, and the split of the excise tax is suggested to be 75%/25% in favour of the provinces (with the federal take not to exceed $100 million for the first two years). We have no particular opinion on this division of taxes; the important takeaway is that the total haul could be massive. Note that the tax will technically be applied to producers (similar to that of gasoline), but here we have assumed a 100% pass-through rate.

Assuming Canadians buy about $6.5 billion worth of adult-use cannabis through legal channels, the **federal government would get its $100 million maximum, while the provinces would capture a stunning ~$700 million from excise taxes alone**. It's noteworthy that this estimate aligns well with the federal budget released last month, in which the Liberal government assumes it will generate $135 million of excise tax in 2020 and $200 million the following year (implying total spending of $5.4 billion and $8 billion, respectively).

In our research, most experts have suggested that taxation of over 25% above the market price tends to incite greater black market use. The level of tax chosen in this case will be like any Laffer curve, where the government should choose to maximize its take while minimizing defection to illicit markets. Several U.S. states are currently grappling with this: Washington recently reduced and simplified its taxation policy, while California is already proposing the same. It's worth noting that comparisons of tax rates are not so simple. Those U.S. markets do not employ Canada's distribution model, meaning Canada's effective tax rate (~60% when including distribution) is much higher.

The final component of taxation is sales tax, which exists in three forms across Canada (HST, GST and PST) and ranges from 5% to 15%. Assuming we use HST of 13%, this would suggest **another ~$300 million for the federal government and over $500 million for provincial governments**.

Exhibit 18. The Taxman Taketh ($ million unless noted otherwise)

Federal Government			Provincial Governments		
Excise tax	Sales tax	**Total**	Excise tax	Sales tax	**Total**
Max $100MM	5%		$1/g less Fed.	8%	
$100	$324	**$424**	$710	$518	**$1,228**

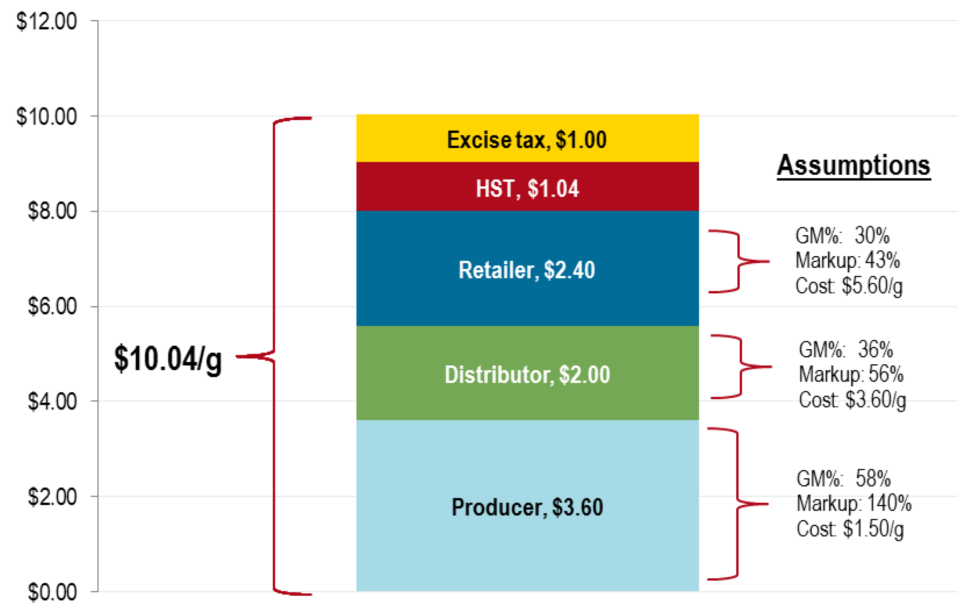
Source: CIBC World Markets Inc.

Retail price before tax: $8/g

Retail price including HST and excise tax: $10.04/g

Taking it all into account, the price of cannabis prior to any taxation is about **$8/g**. Adding HST (for simplicity, we assume 13%) gets the price to $9.04. **The $1 excise tax gets consumers to a final tally of just over $10/g**. Exhibit 19 shows the coalescence of the previous three sections.

Exhibit 19. Adding It All Up: Sources Of ~$10/g



Source: CIBC World Markets Inc.

Economics: Production And Private Sector Retail

Now that we have established revenues at each level of the value chain, it is important to consider the profitability after the investment needed to access those revenues. We once again start with producers and move up to the retailer. Note that we have excluded the distribution economics as that will be within the government sector and not accessible to equity investors.

Producers

We present below our estimate of the economics of production on an assumed facility of 100,000 sq. ft. There is a clear cost advantage to greenhouse growth rather than an indoor-grow facility, but in our research, this is where agreement ends. Opinions vary on quality differences, as well as the extent of operational challenges between the two.

Exhibit 20. Economics Of A (Fictional) LP

	Greenhouse	Indoor grow
Square footage of facility	100,000	100,000
Cost per square foot to construct	$100	$250
Cost of land, per square foot	$20	$20
Total capital costs ($MM)	$12.0	$27.0
Annual production capacity (kg)	10,000	10,000
Price per gram	$3.60	$3.60
All-in cash costs per gram	$1.50	$1.50
Margin per gram (note)	$2.10	$2.10
Revenue ($MM)	$36.0	$36.0
Gross profit ($MM)	$21.0	$21.0
Operating costs ($MM)	$9.0	$9.0
EBITDA ($MM)	$12.0	$12.0
After-tax return on capital	66%	24%

Note: our $2.10/g margin equates to a 58% GM% and 140% product markup

Source: CIBC World Markets Inc.

From our assessment of different LPs, it seems a reasonable heuristic is that the production capacity (in kg) is approximately 10% of the total square footage, which is why producers target incredibly large facilities. The cost per square foot has few scaling benefits, but operating expenses do not increase at the same pace as growing capacity, so the reasoning behind the strategy is obvious.

It's our view that the LPs who started early will have a notable advantage. Most producers will concede that they made mistakes along the way, and rightly so for an essentially brand new industry. Much of the capital required to create production facilities has already been spent, so new entrants will have significant ground to cover to catch up to the larger players.

This is not to say that smaller players will be unable to compete. In the beer industry, craft producers have captured market share despite pricing above competitors due to inherent cost disadvantages. But it strikes us that for nearly 65% of the population, producers will be (indirectly) selling through government-run stores, and it is therefore critical for producers to have arrangements already in place. Without a path to market, more recent producers can have all the square footage in the world, but if there's no buyer, capital related to those projects might not be deployed.

Retailers

As we detailed in Exhibit 1, private sector retail will be limited to provinces that control only the wholesale element (AB, SK, MB, NL, and BC's hybrid system). As such, we base our economics on the sole province, Alberta, in which alcohol retailing is done through the private sector.

Estimates of average unit volumes (AUVs) vary state by state in the U.S., and are heavily influenced by licensure restrictions as well as other regulations. Some reports suggest that the best stores can net nearly $20 million per year in revenues, while some manage with just a few hundred thousand.

In Alberta, it was announced recently that 250 licenses are available in the province (we assume 300 will be in play by 2020). If we apply our estimate of $6.5 billion of adult-use purchases, and assume Alberta captures its proportionate share based on population, then we can deduce that Alberta cannabis sales will total $740 million for retailers. The province has said that it will control online sales at first, so assuming 80% of sales occur from bricks and mortar stores would lead to an **AUV of $2.0 million**.

Exhibit 21. Average Retailer Revenues ($ million)

Cannabis spending, Canada, 2020	$6,500
Alberta share of population	11%
Alberta's share of cannabis sales	$740
% sales from bricks & mortar	80%
AB bricks & mortar sales	$592
# stores	300
AUV	**$2.0**

Source: CIBC World Markets Inc.

Using this as a starting point, we can begin to assess the remainder of the retailers' P&L. We continue with our assumption of a gross margin of approximately 30%, and make reasonable estimates for other operating costs, the largest of which are likely to be labour and rent. As mentioned, we have excluded any contribution from cannabis accessories, which are meaningful, but outside our current purview.

Using the liquor business as guidance, we estimate that the average cannabis store will likely be between 2,000 and 4,000 square feet. This aligns with Liquor Stores N.A's (LIQ) typical convenience-style stores, but is smaller than their overall average.

Exhibit 22. Select Costs - LIQ's Stores In 2017

	Per store ($K)	% of sales
Wages and employee benefits	$207.7	6.4%
Lease and premises costs	$170.2	5.3%
Advertising and promotion	$38.0	1.2%
Merchant processing fees	$24.3	0.7%
Utilities	$20.4	0.6%
Maintenance, janitorial, operating supplies	$17.0	0.5%
Other	$29.3	0.9%

Source: Company reports and CIBC World Markets Inc.

It is our belief that cannabis stores can be run slightly leaner than typical liquor storefronts, with the exception of labour. In addition to needing less space, a cannabis retailer would likely incur lower utilities and repairs & maintenance costs, and may be restricted from traditional advertising. We present below our estimate of a store P&L, with our cost assumptions listed below.

Exhibit 23. Sample Store P&L

	$	%	Note
Sales	**2,000,000**		
COGS	1,399,500	70.0%	1
Paper & packaging	6,000	0.3%	6
Gross profit	**594,500**	**29.7%**	
Labour	244,400	12.2%	2
Benefits & payroll taxes	30,000	1.5%	2
Rent & occupancy costs	80,000	4.0%	3
Marketing	6,000	0.3%	6
Security	25,000	1.3%	6
Utilities	14,000	0.7%	4
Repairs & maintenance	5,000	0.3%	6
Insurance	10,000	0.5%	6
Banking fees	12,000	0.6%	5
Miscellaneous	8,000	0.4%	6
Store-level operating profit	**160,100**	**8.0%**	
Build-out cost	**400,000**		7
After-tax return on capital	**20%**		

Source: CIBC World Markets Inc.

1. **Gross margin.** As demonstrated in Exhibit 19, we assume a retail gross margin of 30%.

2. **Labour**. The average store in LIQ's system incurs labour costs of about $210,000. Sophisticated cannabis stores use technology (iPads, for example) to assist customers in educating themselves, but all our store visits revealed 1-on-1 interaction with clients, and quality of labour can be a key differentiator, so a model more reliant on service seems fair to assume.

   We can also apply some back-of-the-envelope math to double-check these figures. One store manager at, say, $50,000, plus three employees per store for 12 hours per day at $15/hour would imply labour costs of nearly $250,000 per year. Add in payroll taxes and benefits, and **we arrive at our estimate of approximately $275,000.**

3. **Rent**. We have assumed $40/sq. ft. in gross rent and a 2,000 sq. ft. store size, as discussed, **for total rent of ~$80,000 per year**.

4. **Utilities**. LIQ's stores incur roughly $20,000 per store. We have assumed that due to a smaller footprint, and lower energy (i.e. refrigeration) needs, cannabis stores incur just ~$15,000 in utilities per year.

5. **Banking fees**. LIQ's figure of 0.75% of sales seems plausible for cannabis stores. We have reduced this slightly to reflect our view that some consumers will be wary of any payment mechanism that documents their visit.

6. **Other**. For a 2,000 sq. ft. store, we believe insurance, maintenance, marketing and other ancillary costs likely won't exceed $60,000/year.

7. **Build-out cost**. On the exterior, cannabis stores are not all that different from any other type of retailer.

Exhibit 24. Cannabis Storefronts In Denver

Source: CIBC World Markets Inc.

The easiest way to assess the buildout cost is to look at what licensing bodies require cannabis store applicants to have in liquid capital. In Arizona, it's $150,000; in Nevada, it's $250,000; Massachusetts requires $500,000. These figures likely include funding for working capital as well as a buffer against unexpected losses. We'll take the midpoint of those high and low figures, convert to Canadian dollars, and round to $400,000.

Return On Investment. Assuming all of these estimates, the typical cannabis store would provide an after-tax return of about 20%, similar to many other facets of the retail world. It is worth noting that if online sales are transitioned to private retailers, this would meaningfully boost retailers' returns.

Key Question: How Will Retailers Differentiate?

Like in any other facet of retailing, there will be winners and losers in the market. Here are the ways that retailers can succeed.

- **Price** - We begin with the simplest differentiator. As we showed in Exhibit 10 in this report, different variations of cannabis are priced differently to account for THC/CBD content, desired terpenes, and potentially brand prestige. But for the exact same product, if Store A offers a better price than Store B, that will be the critical differentiator for many customers. That said, in selling a controlled and regulated product, with no room for advanced buying tactics (theoretically all retailers will buy from provincial distributors at the same price), **differentiating materially on price will be a challenge**.
- **Service** – It's likely that many customers will be uninformed on the intricacies of the product, so educated, friendly store associates (or "budtenders", in industry parlance) will be critical. Even cannabis aficionados will require learned employees to help them seek out their desired product, the same way an LCBO customer seeking a quality vintage pinot noir will want professional assistance. As mentioned, cannabis stores use a 1-on-1 model for customer interaction, and in our proprietary research, **we found service to be the most critical differentiator in impacting the overall store experience**.
- **Product** - What may act as a differentiator is retailers' ability to offer the most sought-after items. The more critical element in our view is that **stores must offer products that consumers know**. The most famous variants—ones that win awards at the Cannabis Cup, for example—are consistently more desired in our store visits than "private label" strains. Naming strains after Canadian landmarks (Rideau, Champlain, etc.) may win points with some users, but for most, they want a strain they recognize and can research. Product quality—and relevant brands—will be especially critical once consumable products are legalized.

- **Location** – Stores in convenient locations, co-located with other anchor tenants (dollar stores, grocery stores, pharmacies, quick-service restaurants) with easy access and ample parking, will hold an advantage.
- **Ambiance** – This is perhaps the greatest wildcard when it comes to elements of retailing. Stores could attempt to differentiate through the use of a pleasing vibe, great music, ability to enjoy products in an adjacent café, or many of the other fun elements of a retail experience.

What If? A Ford victory in Ontario's June election spurs the country's largest province to abandon plans for government-run stores, leading to a "wild west" process of zoning and licensing with just months to spare before legalization. After a few bumpy months, private Ontario stores become among the best performers in the country, receiving rave reviews. As Ontarians see lower cannabis prices than their neighbours to the east, consumers are eager for change elsewhere, calling for a complete privatization of the LCBO.

Our Take – In our experience, there is no one model that outperforms all others on the cannabis scene. The most successful cannabis stores will be those that offer some attractive combination of the above-mentioned factors. Price will certainly be critical, but we suspect stores will have relatively similar pricing, allowing them to compete on other factors, and much like in any other retail concept, execution will be the key differentiator.

Conclusion

It is clear that there are numerous unknowns in the development of the adult use cannabis market in Canada. Despite this, a structured approach to investing in the space necessitates a holistic perspective on what the industry will look like – and a host of assumptions. Our outlook for the industry in 2020 was originally shown in Exhibit 1 and is based on our work described in the previous 27 pages.

We essentially built from the bottom up. We start with the likely cost of production and likely producer margin. This allows us to establish a business model for most LPs. From here, we assume a "reasonable" distribution margin for the provinces – akin to what we see in alcohol. The last step is to consider the retail margin - again, using the experience in alcohol retailing by the provinces – and add in our detailed knowledge of the economics of merchandising to establish business models.

We concede that there are many unknowns in this evolving industry, and much is subject to change, but by our estimates, using reasonable assumptions, **we believe the industry will generate roughly $1 billion in EBITDA by 2020, with LPs capturing the lion's share of this amount**.

The International Cannabis Opportunity

The international market potential for legal cannabis appears to be very attractive. However, estimating the international market size for cannabis relies, in large part, on assumptions about how cannabis policy reform for both medical and recreational use will unfold in individual countries. International cannabis trade is currently restricted to medical cannabis and this is unlikely to change in the foreseeable future. The table below shows the countries where medical cannabis is legal and which of those has also legalized recreational use. Note that each country has specific restrictions on the prescribing and dispensing of medical cannabis.

Exhibit 25. Legal Status Of Cannabis By Country

Country	Medical	Recreational	Decriminalized
Austria	Yes	No	Yes
Argentina	Yes	No	Yes (Undear Laws)
Brazil	Yes	No	Yes
Australia	Yes	No	No
Canada	Yes	Yes	No
Chile	Yes	No	Yes
Colombia	Yes	Yes	Yes
Croatia	Yes	No	Yes
Czech Republic	Yes	No	Yes
Denmark	Yes	No	Yes
France	Yes	No	No
Finland	Yes	No	No
Germany	Yes	No	Yes
Greece	Yes	No	No
Israel	Yes	No	Yes
Italy	Yes	No	Yes
Jamaica	Yes	No	No
Lesotho	Yes	No	No
Macedonia	Yes	No	No
Mexico	Yes	No	Yes
Norway	Yes	No	Yes
New Zealand	Yes	No	No
Netherlands	Yes	No	Yes
Peru	Yes	No	No
Philippines	Yes	No	No
Poland	Yes	No	No
Romania	Yes	No	No
San Marino	Yes	No	No
Switzerland	Yes	Yes	Yes
Turkey	Yes	No	No
U.S. (29 states)	Yes	9 states	No
Uruguay	Yes	Yes	Yes
Zambia	Yes	No	No

Source: CIBC World Markets Inc.

Opportunity Exists For Canadian LPs, But Importation May Be A Bridge To Local Production

Canada is emerging as a leader in the world when it comes to establishing quality production standards, and the Canadian ACMPR is being used as a model for medical cannabis regulations in other countries. We believe most countries see import arrangements with Canadian LPs as temporary until local production can meet demand. Companies with a desire to capitalize on the international cannabis market will likely need to set up local production facilities in the respective countries as some LPs have already started doing. As countries issue their own domestic licenses, the export opportunity will lessen, but may be somewhat balanced by new countries allowing imports. The creation of joint ventures and the building of production facilities in other countries may help to maintain business longer term. In fact, many Canadian companies have already entered partnerships and joint ventures to sell their products in key foreign markets such as Brazil, Germany, Scandinavia, Australia, South America, and others.

Third-party Global Cannabis Market Size Estimates Vary Widely

Based on a review of third-party market research reports, one could estimate the global cannabis market to be approximately **$25 billion-$30 billion in 2020**. However, future estimates vary widely.

- According to the Brightfield Group, the global cannabis market is currently valued at $7.7 billion and is expected to hit $31.4 billion in 2021, a CAGR of 60%, as other countries change their cannabis laws. In line with Canadian government expectations, the group expects the Canadian recreational market to open in 2018, and reach $5.7 billion by 2021. Brightfield estimates that the U.S. and Canada together are expected to make up more than 86% of global cannabis sales in 2021. European markets, dominated by Germany, the Netherlands, Spain and Switzerland, will follow with 12% of the global market.
- According to Arcview Market Research, spending on legal cannabis worldwide is expected to hit $57 billion by 2027 (67% recreational and 33% medical). The firm expects the largest group of cannabis buyers to be in North America, growing from $9.2 billion in 2017 to $47.3 billion in 2027, while rest-of-world markets are projected to be $2.5 billion in 2027.
- Perhaps as somewhat of an outlier, London-based Prohibition Partners forecasts the entire European cannabis market alone to be valued at $59 billion, including both medical and recreational use, assuming full legalization. It appears that Europe may become one of the largest cannabis markets, as most European countries have already legalized medical use.

The attractiveness of the international market opportunity is moderated by the fact that only a handful of countries are allowing importation at this time. Specific country markets each have their own challenges. We briefly discuss a few of the largest foreign markets below.

United States

As mentioned, in the U.S., cannabis companies are hindered by federal legislation that still deems cannabis illegal. While the U.S. market is very attractive given its size and geographic proximity, it may be more difficult for Canadian LPs to service U.S. demand versus serving ex-U.S. markets. In the states where cannabis is legal (medical cannabis is legal in 29 states, while recreational use is only legal in nine of those states), the market is quite well served by the local production. Nevertheless, selected Canadian LPs have entered the U.S. market by acquiring or investing in local producers in specific states.

The Marijuana Business Daily reports that total 2017 legal cannabis sales (medical and recreational) in the U.S. are expected to be in the range of $5.1 billion-$6.1 billion, reflecting approximately 25% growth Y/Y. This increase was mainly due to growth in states that approved recreational usage, such as Colorado, Washington and Oregon. Including the illicit market, consumer spending on cannabis in North America amounted to an estimated $56.1 billion in 2016, 88% of it outside legal channels, indicating the potential of the recreational market if completely legalized.

Germany

The German parliament unanimously passed its framework for legalizing medical cannabis last year, and the law came into effect in March 2017. German political parties are considering recreational legalization as part of their talks in forming a coalition government. The medical legislation allows physicians to prescribe cannabis to patients with multiple sclerosis, chronic pain, and appetite loss or nausea due to chemotherapy, expanding use from the earlier high bar of patients with “serious medical conditions”, and qualifying the product for health insurance reimbursement. Doctors may only prescribe medicinal cannabis to severely ill patients if they can demonstrate that other therapies are not promising.

There are currently no domestic producers in Germany. To meet the post-legalization increased demand, Germany has been importing product from multiple sources, including Canadian LPs, the Netherlands, and Israel. However, the country plans to allow state-supervised cultivation for medical purposes, with availability planned for 2019. Back in June 2017, 118 companies had applied for a medical cannabis cultivation license in Germany. We are uncertain where in the approval process these applicants currently stand. Canadian and other foreign firms could be exporters with distribution partners for the foreseeable future, but need to establish local production facilities, since trade barriers may be implemented to protect the fledgling domestic cannabis infrastructure.

Latin America

Much of Latin America is considering legalizing or decriminalizing cannabis. Uruguay became the first country in the world to approve recreational use. Other countries have followed suit, including Colombia, Chile, and Peru. In Brazil, recreational cannabis is illegal and medical use is restricted to extracts. Brazil’s health regulator legalized personal importation of medical cannabis in 2016, and approved the sale of the first cannabis drug in early 2017 (Sativex from GW Pharma). Brazil has not legalized cultivation yet, so cannabis supply is through importation. It is believed that much of the incentive for legalization in Latin America is to control the illegal elements. Looking forward, we are uncertain how attractive the Latin American market may be given the potential for lower-cost production in the region.

Australia

Recreational cannabis is illegal in Australia, but the country did legalize medical cannabis (for epilepsy, multiple sclerosis and chemotherapy side effects) in October 2016. Subsequently, in February 2017, it permitted importation as a temporary measure until local production was ramped up to meet demand. Members of the Australian Medical Association have mixed feelings about legalization, stating concerns about lack of clinical evidence, and the potential for long-term adverse effects. Australia has witnessed slower-than-anticipated acceptance by the medical community, and the administrative hurdles for prescribing have been high. Consequently, in Australia the medical use of cannabis remains very low.

Rough estimates published by the University of Sydney estimated the legal industry at A$100 million (US$78 million). A year later, Australia has now become the fourth country in the world after Canada, Netherlands and Uruguay to legalize cannabis export, allowing local companies to target the international market.

Assessing The LPs

We present below a series of metrics for 10 publicly traded LPs whose market cap is greater than $200 million. We do not express an opinion on the companies included, but we believe that critical factors will include current production capacity, capacity completed by the end of 2018, current inventory on hand, and the ability to produce derivative products beyond dried flower. Furthermore, supply deals with provincial buyers will be critical; however, by our estimates, provinces have announced less than 100,000 kg worth of contracts, so a great deal of market share is still up for grabs.

Capacity estimates for 2018 and beyond will be determined based on the skill of management to progress their projects at a rapid (but relatively mistake-free) pace, and also to arrange supply agreements with provinces, and have customers demand their product. At first, we believe provinces will accept product from anyone who has product on hand, as there is likely to be a shortage. Once the supply balance corrects, determining winners will come down to two main factors, in our view: which LPs are chosen by the provinces (likely based on reliability and reasonable pricing); and which LP produces the products that consumers most enjoy.

What's It All Worth?

This is the critical question, and while this report will not delve into the worth of any individual LP, we believe it's worth assessing the industry as a whole from a valuation perspective. As we surmised in Exhibit 1, we believe that all of the LPs combined will generate EBITDA of around $860 million. The comparable industries we look to—alcohol and tobacco producers—trade at about 14x and 13x EBITDA, respectively.

Exhibit 26. Valuation Of Tobacco And Alcohol Producers

	EV/EBITDA (NTM)	EBITDA % growth, 19 v 18
Tobacco		
Altria	13.0x	7.0%
Imperial Brands	9.0x	2.0%
British American Tobacco	12.1x	7.0%
Philip Morris	13.1x	9.5%
Median	**12.5x**	**7.0%**
Alcohol		
Constellation Brands	16.7x	9.7%
Andrew Peller	14.0x	9.7%
Heineken	11.6x	6.3%
Diageo	15.9x	6.2%
Anheuser-Busch Inbev	13.4x	7.5%
Carlsberg	9.8x	4.2%
Pernod Ricard	15.8x	5.4%
Corby	11.7x	7.7%
Median	**13.7x**	**6.9%**

Source: FactSet.

But those industries' growth prospects are, in our opinion, below that of cannabis. They also don't have the potential medical angle, which we concede is challenging to value, but it's difficult to debate the notion that it's additive to valuation. If we apply a premium to liquor/tobacco, and use 20x, this would indicate an industry-wide valuation of $17 billion. Interestingly, despite the perception of a wildly overvalued industry, the sum of the enterprise values among the LPs is approximately $18 billion. But we concede that the industry's valuation should be discounted not only for time, but also uncertainty.

This means that the opportunities from international medical and adult-use proliferation need only be ~15% of the Canadian market to justify such a valuation. It may strike some investors as a bit of a surprising conclusion that the cannabis space is somewhat fairly valued amidst all of the headlines of irrational exuberance. But in our view, valuation concerns aren't on the industry, but rather individual producers. It's our opinion that the likely outcome of this burgeoning industry, like many in previous history that essentially have a growth trajectory that is unknown but materially positive, is that there will be many losers along the way, and **likely some industry titans that will be around a century from now.**

Exhibit 27. Industry Valuation ($ millions)

Projected EBITDA of LPs, 2020	$860
Industry multiple	20.0x
Industry valuation (producers), 2020	$17,200
Discount	10%
Industry valuation (producers), 2019	**$15,480**
Current sum of LPs' enterprise values	**$17,835**
EBITDA required internationally	$118

Source: CIBC World Markets Inc.

Provincial Deals Already Announced

The provinces have thus far been coy in announcing who their main suppliers will be, but below is a summary of the arrangements that are currently public knowledge (Ontario, Alberta, BC and others have yet to make their plans known). Note that we disregard supply deals with pharmacies, as there is currently no indication that this will become a channel for medical use. As well, LPs could have deals signed with provinces that are not yet announced.

- **Quebec** has announced supply contracts for **62,000 kg**: 20,000 kg to Hydropothecary; 12,000 kg to each of Aphria and Canopy; 8,000 kg to MedReleaf; and 5,000 kg to each of Aurora and Tilray. The province has also agreed to three-year deals with some of these firms, in what we believe will likely become a more commonplace arrangement among the other provinces.
- **New Brunswick** has announced **15,500 kg** worth of deals: 5,000 kg to Organigram; 4,000 kg to Canopy; 4,000 kg to Zenzabis; and 2,500 kg to Aphria (via Nuuvera).
- **Newfoundland & Labrador** has announced **8,000 kg** in supply, entirely to Canopy.
- **PEI** has locked up 3,000 kg in supply, split equally between Canopy, Organigram, and Canada’s Island Garden.

Exhibit 28. LPs, Part 1

	PRODUCTION					FINANCIALS						
	Production capacity, kg							FactSet Consensus				
	Current (1)	2018 Target (1)	2019 Target (1)	Announced supply deals with provinces (4)	KG sold, MRQ	Revenue, MRQ, annualized ($MM)	Pro forma revenue ($MM) (2)	C2019 Revenue	C2019 EBITDA	Market cap ($MM)	Net debt / (cash) (1)	EV
Aphria Inc.	35,000	225,000	225,000	14,500	1,428	$41	$810	$482	$173	$2,051	-$125	$1,926
Aurora Cannabis Inc.	27,800	132,300	280,000	5,000	1,162	$47	$476	$445	$157	$4,426	-$421	$4,005
Canopy Growth Corporation	200,000	250,000	325,000	25,000	2,330	$87	$900	$760	$157	$5,805	-$382	$5,424
Cronos Group Inc.	6,650	47,150	68,150	0	na	$6	$170	$134	$43	$1,316	-$145	$1,171
MedReleaf Corp.	16,500	35,000	140,000	8,000	1,263	$45	$126	$335	$125	$2,258	-$237	$2,021
CannTrust Holdings, Inc.	25,000	52,500	52,500	0	758	$28	$189	$200	$72	$678	-$17	$661
Organigram Holdings Inc.	22,000	36,000	81,000	6,000	359	$15	$130	$144	$47	$506	-$82	$424
The Supreme Cannabis Company	5,000	50,000	50,000	0	na	$7	$180	$150	$55	$396	$31	$427
The Green Organic Dutchman	1,000	14,000	116,000	0	0	$0	$50	na	na	$739	-$226	$513
Hydropothecary Corp.	4,000	25,000	108,000	20,000	132	$5	$90	$128	$32	$654	-$265	$389

(1) CIBC estimates compiled through most recently published publicly available data

(2) Calculated as 2018 Target x CIBC estimate for wholesale price/g ($3.60)

(3) As at time of publication

(4) As at May 7, 2018, the only provinces to have announced supply arrangements are Quebec, New Brunswick, Newfoundland, and PEI.

Source: FactSet, company reports and CIBC World Markets Inc.

Exhibit 29. LPs, Part 2

	PRODUCTS				VALUATION							INVENTORY	
					EV / S		EV to kg capacity					Most recent quarter	
	Available flower strains (3)	Gel capsules (3)	Oils (3)	Dealer's license (3)	Revenue, MRQ, annualized	Pro forma revenue (2)	Current (1)	2018 Target (1)	2019 Target (1)	EV / EBITDA (2019 cons.)	EV / sales (2019 cons.)	$	KGs (000s; or equivalent) (1)
Aphria Inc.	18	No	Yes	Yes	46.9x	2.4x	55.0x	8.6x	8.6x	11.1x	4.0x	$14.2	1.8
Aurora Cannabis Inc.	17	No	Yes	No	85.6x	8.4x	144.1x	30.3x	14.3x	25.5x	9.0x	$17.1	2.1
Canopy Growth Corporation	40	Yes	Yes	Yes	62.5x	6.0x	27.1x	21.7x	16.7x	34.5x	7.1x	$105.9	13.2
Cronos Group Inc.	21	No	Yes	Yes	181.8x	6.9x	176.1x	24.8x	17.2x	27.2x	8.7x	$11.8	1.5
MedReleaf Corp.	18	Yes	Yes	No	44.5x	16.0x	122.5x	57.7x	14.4x	16.2x	6.0x	$27.9	3.5
CannTrust Holdings, Inc.	6	No	Yes	Yes	23.7x	3.5x	26.4x	12.6x	12.6x	9.2x	3.3x	$20.5	2.6
Organigram Holdings Inc.	22	No	Yes	No	28.7x	3.3x	19.3x	11.8x	5.2x	9.0x	2.9x	$12.9	1.6
The Supreme Cannabis Company	na	na	na	No	63.5x	2.4x	85.4x	8.5x	8.5x	7.8x	2.8x	$2.5	0.3
The Green Organic Dutchman	36	No	No	No	na	10.2x	513.0x	36.6x	4.4x	na	na	$0.0	0.0
Hydropothecary Corp.	14	Yes	Yes	No	82.3x	4.3x	97.3x	15.6x	3.6x	12.2x	3.0x	$8.6	1.1

(1) CIBC estimates compiled through most recently published publicly available data

(2) Calculated as 2018 Target x CIBC estimate for wholesale price/g ($3.60)

(3) As at time of publication

(4) As at May 7, 2018, the only provinces to have announced supply arrangements are Quebec, New Brunswick, Newfoundland, and PEI.

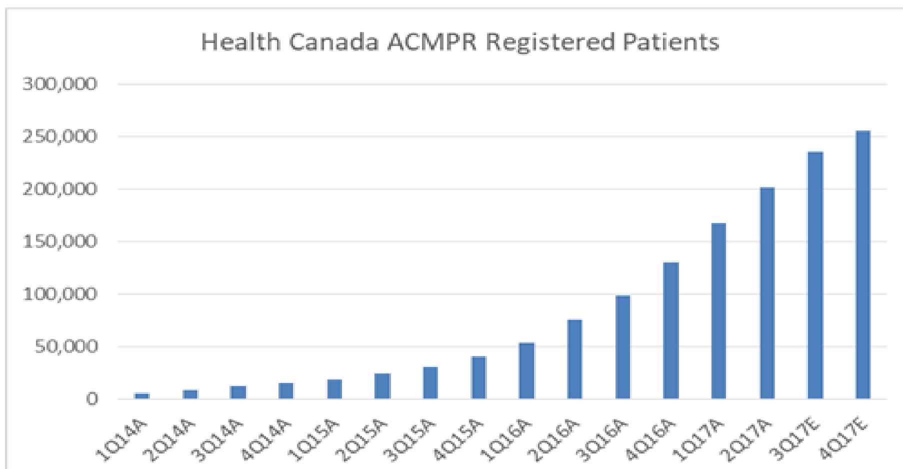
Source: FactSet, company reports and CIBC World Markets Inc.

Appendix: Overview Of Medical Cannabis In Canada

Background On Medical Cannabis In Canada

Cannabis is not an approved drug in Canada as it does not meet the safety and efficacy requirements to the extent required by Health Canada, the regulatory authority. Nevertheless, cannabis for medical purposes has been legal in Canada since 2001, and guidelines for the cultivation and use of medical cannabis in Canada are provided for under the *Access to Cannabis for Medical Purposes Regulations* (ACMPR). It was not until late 2013 when the number of registered patients started to grow, and the industry started to gain momentum after the federal government enacted new regulations on cannabis production. Increased awareness of the potential therapeutic benefits of cannabis, combined with a lifting of the stigma related to the use of cannabis, have helped to boost the number of registered patients four-fold over the last two years to over 250,000 patients today. We caution, however, that this number is misleading since many patients are double-counted. It is important to note that “active registrations” does not refer to how many individuals are registered, as Canadians can have more than one active registration at a time.

Exhibit 30. ACMPR Registrations (2014 – 2017)



Source: Health Canada.

Key Points About The ACMPR

In August 2016, Canada introduced the latest regulations for medical cannabis, the ACMPR, which authorizes activities for patients eligible for medicinal marijuana use, and also authorizes selected suppliers to grow cannabis through the issuance of licenses. Upon authorization by a physician, patients can choose to either purchase their cannabis through a Licensed Producer (LP), produce/grow cannabis themselves, or designate someone to produce/grow cannabis for them.

- The ACMPR allows patients to legally purchase and possess medical cannabis by receiving an authorization (referred to as a “medical document”) and then using it to register with an LP or Health Canada.
- A “medical document” is similar to a prescription and even considered equivalent to one in many provinces. The College of Physicians and Surgeons of Ontario has ratified a policy disallowing doctors from charging fees for this document.

- Cannabis ordered through an LP is sent to the patient's residence via courier.
- LPs are only able to sell cannabis oils and dried cannabis to their patients. Additionally, LPs can sell starting matters (i.e., seeds and clones) to patients registered with Health Canada to grow at home. Patients are legally able to turn their cannabis into whichever form they require, although some limitations apply.
- Patients can possess up to 30x their daily authorized amount or 150g, whichever is less. If a patient's monthly authorized amount exceeds 150g, multiple monthly orders are required to prevent exceeding this limit.

ACMPR also authorizes select suppliers to produce cannabis via the issuance of licenses. Health Canada currently has authorized 102 LPs.

Exhibit 31. Licensed Producers (LPs) By Region

Source: Health Canada.

Physician Prescribing Of Medical Cannabis

As of September 2017, Health Canada reported that 2,643 medical practitioners provided a medical document for Canadians to access medical cannabis. The total number of medical practitioners who have ever provided access is 10,433. This is perhaps a reflection of the frustration many patients and physicians feel when dealing with unrelenting symptoms that are not relieved by conventional treatments. Market research has suggested that 12% of physicians have prescribed cannabis, 35% of physicians would NOT prescribe under any circumstances, and ~52% of physicians are interested, but need more data and information. In the absence of Health Canada approval of cannabis-based products, we do not believe physicians will be proactive in prescribing medical cannabis, but instead may prescribe in reaction to patient inquiry or demand.

The Role Of Pharmacy And Pharmacists

We believe that pharmacies will be authorized to dispense medical cannabis in the future, although the timing is likely to be in 2019 by the time all the logistics are in place. Many pharmacists are already being trained about the product, in preparation for this eventuality. While there are differing opinions amongst pharmacists about the dispensing of medical cannabis, similar to what we see amongst physicians, most see a strong role for pharmacy as the direct contact with patients for medical cannabis. Furthermore, provincial pharmacy associations are lobbying the government and the medical cannabis industry to serve as the medical cannabis gatekeepers and the bridge between the LPs and the patients in the interests of safety and monitoring of medical access. We do not see pharmacies being involved in the sale of recreational cannabis, as this may cross an ethical boundary, but there could be a role to play in the future if potential cannabis-containing OTC products come to market.

Medical Cannabis – Evidence Still Catching Up To Usage

The Science Behind The Medical Use of Cannabis

Cannabis has been used as a potential treatment for multiple ailments, although scientists know very little about its mechanisms of action. The plant has about 120 chemical compounds that could have activity in the body, but currently, the two main cannabinoids from the marijuana plant that are of medical interest are tetrahydrocannabinol (THC) and cannabidiol (CBD). THC is responsible for the psychoactive effects of cannabis, while CBD is non psychoactive.

The list of conditions where medical cannabis is claimed to have beneficial effects is lengthy, and getting longer. A few of the more common uses of medical cannabis include:

- pain management;
- epilepsy;
- spasticity due to a neurological condition (e.g. MS);
- stimulation of appetite in AIDS and cancer patients; and,
- prevention of nausea associated with chemotherapy.

Evidence For The Medical Use of Cannabis Is Mixed, But More Research On The Horizon

In June 2015, the Journal of the American Medical Association published an analysis of 80 studies looking at its efficacy. Researchers found some evidence that cannabinoids can reduce chronic pain and the muscle contractions or involuntary movements suffered by many with multiple sclerosis. But there was little proof it helps reduce anxiety, nausea and other symptoms of chemotherapy or sleep disorders. Researchers also did not find evidence to show cannabis promotes weight gain in HIV patients. Research into the effects of cannabis on opioid use in pain patients is limited, but data suggest that medical cannabis treatment may reduce the dose of opioids required for pain relief. Some preliminary studies have suggested that medical cannabis legalization might be associated with decreased prescription opioid use and overdose deaths, but researchers don't have enough evidence yet to confirm this finding.

Research on medical cannabis, especially in the U.S., has been stifled by the fact that cannabis is illegal at the federal level and it is difficult for scientists to order or possess the product, even for research purposes. The available research on the medical use of cannabis is also inconsistent and often inconclusive. While some studies show patient benefits, other trials do not demonstrate the same findings. One of the key challenges in conducting properly designed clinical trials for medical cannabis is being able to have a valid placebo since the presence of THC provides patients with a “high” and thus informs them that they are receiving the “active” product.

Cannabinoid-based Pharmaceutical Market

Big Pharma Unlikely To Have The Paradigm Shift Needed To Pursue Medical Cannabis

Health Canada and the U.S. FDA will not approve medical cannabis with specific prescription or official status without well-structured, conclusive clinical studies showing safety and efficacy. However, cannabis is not a single chemical, rather a plant containing multiple chemical components that can vary in strength and medicinal efficacy. Other than THC and CBD, researchers know very little about the hundreds of others. One of the key reasons that mainstream pharmaceutical companies are not well suited to cannabis is that patients often find that whole-plant medicines are more effective than pharmaceutical cannabis medicines. There appears to be a synergistic effect of the various chemicals working together in providing patients relief from symptoms. This goes against the business model of the pharmaceutical industry that prefers to test single chemicals on single targets.

Limited IP Protection Deters Pharma Industry Involvement

Pharma companies have historically stayed away from trying to capitalize on the medicinal effects of cannabis, and we do not see this materially changing. Currently, cannabis and its active ingredients are considered natural products and cannot be patented, hence there is no barrier to entry on such a product. Mainstream pharma is not likely to wade into a sector where its R&D efforts cannot be protected and where a sustainable competitive advantage cannot be gained. While there is some effort to chemically alter cannabinoids in order to make them patentable, any success on this front would not have an impact on the medical cannabis market for many years. The main cannabis-based pharma product development that is occurring is focused on new formats and delivery systems that could be used in specific indications. This R&D is being done primarily at smaller companies, and not the mainstream pharma players.

The FDA has not yet approved a drug product containing or derived from the whole cannabis plant. It has, however, approved three cannabinoid-based medicines derived from isolated synthetics: Marinol, Syndros, and Cesamet. As clinical research continues, there are likely to be more in the future.

Exhibit 32. Cannabis-based Pharmaceuticals On The Market Or In Late-stage Development

Cannabis-Based Pharmaceuticals Marketed / Late Stage Development			
Product	***Company***	***Status***	***Details***
Marinol (dronabinol)	AbbVie	FDA approved	Synthetic isomer of THC. Oral tablet. Now generic. Treatment of chemotherapy-induced nausea and vomiting Treatment of AIDS wasting syndrome
Syndros (dronabinol)	Insys	FDA approved	Synthetic isomer of THC. Oral liquid. Treatment of chemotherapy-induced nausea and vomiting Treatment of AIDS wasting syndrome
Cesamet (nabilone)	Valeant	FDA approved	Synthetic THC derivative Treatment of chemotherapy-induced nausea and vomiting
Sativex (nabiximols)	GW Pharma	Approved in 30 countries ex-US (UK, Canada, EU)	Oromucosal spray containing 1:1 THC and CBD Treatment of spasticity and neuropathic pain associated with multiple sclerosis
Epidiolex	GW Pharma	NDA filed with FDA (positive Advisory Committee recommendation; PDUFA date June 27, 2018)	A CBD-based liquid being tested in the US for treatment of two forms of severe childhood epilepsy: Dravet syndrome and Lennox-Gastaut syndrome

Source: Company reports and CIBC World Markets Inc.

Pricing And Reimbursement Of Medical Cannabis

The future of the official medical market will be highly influenced by the price differential between medical and recreational cannabis. The current view on taxation suggests that both medical and recreational cannabis will be subject to both excise tax and sales tax, with little to no pricing differential. Patient groups are protesting, as this increases the price they are paying now, and reimbursement is almost non-existent for most patients. In the absence of reimbursement, we question the motivation that many patients have to remain categorized as “medical cannabis users” and still have to go through their doctors and order directly from LPs.

Cannabis for medical purposes is reimbursed in Canada on a very limited basis. With the exception of defined coverage for veterans, the government and most of the private extended health drug plans do not reimburse the cost of medical cannabis. There appears to be some effort on the part of LPs to provide patient assistance programs for those who cannot afford the cost of their prescribed medical cannabis, although the extent of this offset is unclear.

Clinical trials and formal indication approvals could change the situation, but generating the clinical data necessary for a drug approval is a high hurdle. In the meantime, patients suffering serious conditions that respond well to THC or CBD may be in a position to petition for reimbursement, and many patients are apparently willing to pay out of pocket.

Federal Reimbursement Limited To Veterans

Effective May 21, 2017, Veterans Affairs Canada (VAC) implemented its new reimbursement policy for medical cannabis with a maximum 3g/day limit (reduced from 10g/day) at a price of $8.50/g of dried cannabis or equivalent amounts of oil, with additional authorizations required to exceed the limit under exceptional circumstances. VAC will now also reimburse veterans for cannabis oil and fresh cannabis to the equivalent of 3g/day of dried cannabis per day. The VAC reimbursement limit was based on consultations with medical experts, veterans, and licensed producers as well as on external research.

Private Insurers Reluctant To Cover, But Changing Slowly

There continues to be a lack of good research on the impact of adding medical cannabis to insurance drug programs, so for now most employers remain reticent to include it as a benefit. The process of improving reimbursement coverage is moving slowly, and some employers have taken the lead. For example, in the spring of 2017, Loblaw Companies and Shoppers Drug Mart announced that they would cover medical cannabis under their employee benefit plans up to a maximum of $1,500/year, but only for two specific indications: (i) the treatment of spasticity and neuropathic pain associated with multiple sclerosis and (ii) nausea and vomiting in chemotherapy for cancer patients.

On June 15, 2017, the Ontario Public Service Employees Union (OPSEU) began rolling out a new benefit that provides medical cannabis coverage for insured OPSEU staff. With this new benefit, insured employees and their spouses and dependents can claim up to $3,000 a year for medical cannabis. For eligibility, they must be prescriptions from licensed physicians, and the cannabis must be obtained from an LP. There will be no limitation on the medical conditions eligible for medical cannabis coverage under the new benefit.

We would expect that, in the coming years, more insurers will add medical cannabis to their coverage lists, albeit on a restricted use basis. The impetus to do so will need to come from patients and their employers. Canada's medical cannabis industry is lobbying for government health plans and private insurers to cover medical cannabis like other treatments. We question whether the industry will continue to exert the same pressure once recreational use is legalized and companies find themselves in a supply shortfall. Nevertheless, over time, we anticipate that private insurance coverage of medical cannabis will parallel the current situation for paramedical claims (e.g. physiotherapy, massage therapy, acupuncture, chiropractic, etc.) where these services are covered to specific annual maximums in the range of $500 - $1,500 per year.

Key Success Factors In The Medical Cannabis Market

Although the medical segment appears to be experiencing strong growth, there are some key differentiating factors that we feel LPs will need to focus on to build and maintain market share.

1. **Quality assurance** – Differentiation on quality and consistency is important for the medical market since the product is being used for the treatment of a medical ailment, and medical products are always held to a higher standard than consumer products. Since patients may be controlled on a specific dose/ type of cannabis, then they will come to rely on a product to deliver the required dose on a regular and reliable basis.

2. **Range of cannabis types/strengths** – LPs will need to have a broad range of product offerings to cater to the individual needs of patients and their ailments. This refers to different plant types that yield differing concentrations of THC and CBD, as well as differing terpene content.

3. **Patient promotion** – The competitive nature of the industry will likely necessitate a certain degree of effort placed on patient acquisition and retention to grow and maintain market share. The more the industry matures, and the more product differentiation becomes less of an advantage, the more a patient-centered strategy becomes important.

4. **Reimbursement support** – LPs that support patients in their struggle to pay for their medical cannabis, and in their battle to secure reimbursement, may have an advantage over time. Implementing processes that assist patients in the reimbursement process can be impactful.

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Restricted	7	2.2%	Restricted	7	100.0%

Ratings Distribution: Consumer Staples Coverage Universe

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Underperformer (Sell)	0	0.0%	Underperformer (Sell)	0	0.0%
Restricted	2	13.3%	Restricted	2	100.0%

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