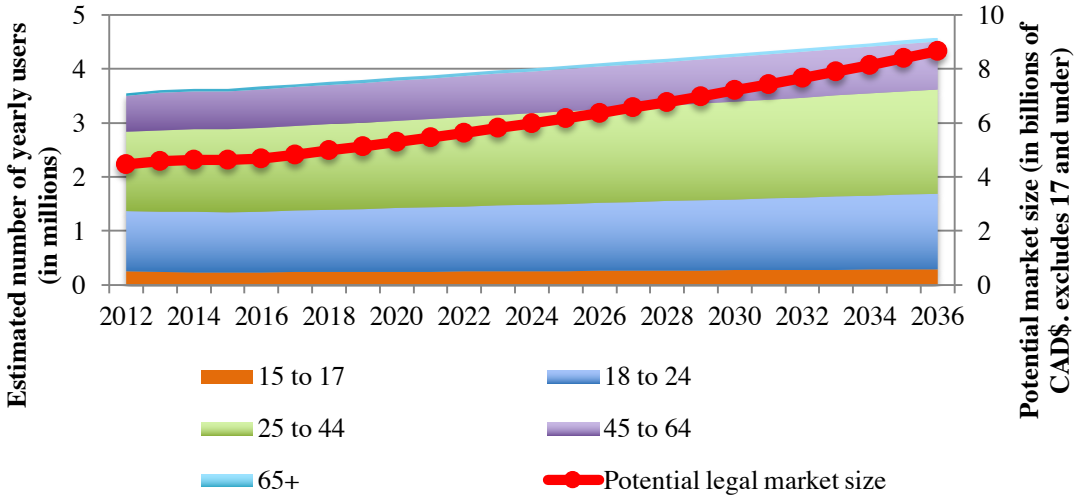
The Cannabis Market in Canada and British Columbia

1. The Canadian Cannabis Market

Estimates suggest consumption of cannabis for recreation purposes in Canada to be around 770,000kg a year, implying a market worth around $5 billion (CIBC World Markets, 2016). Additionally, Health Canada expects the medical marijuana market to be worth approximately $1.3 billion (CIBC World Markets, 2016). There has been no large increase in cannabis usage in American states where recreational use has been legalized, and there is no reason to believe this would be otherwise in Canada. Figure 1 shows a conservative estimate of the number of cannabis users and potential size of the legalized market, based on a 2016 Canada-wide market value of $5 billion.

Figure 1. Conservative* estimate of the number of cannabis users, potential size of legalized market

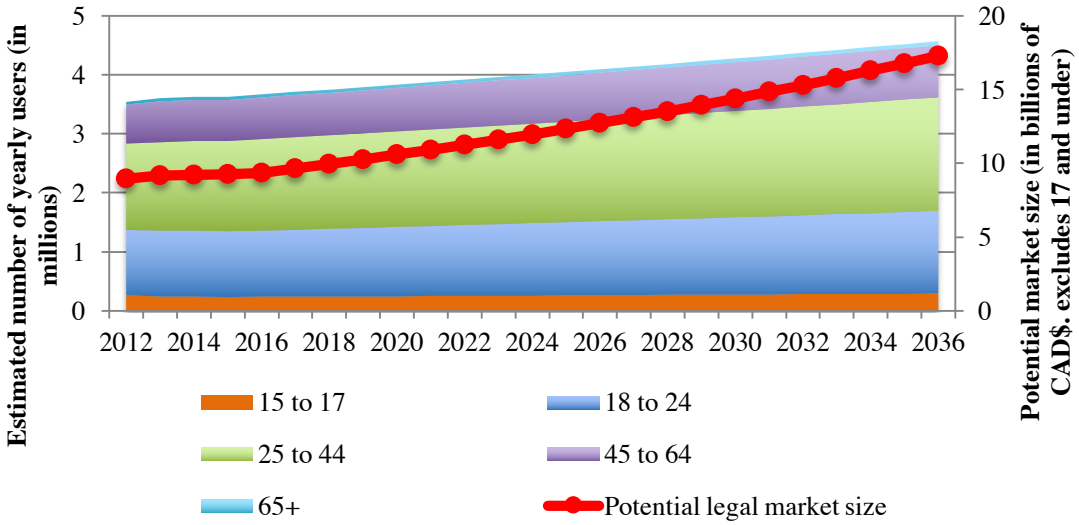


*Based on Canada-wide market value of $5 billion in 2016.
** Legal market size excludes consumption by individuals aged 17 and under.
Sources: Created by the author based on Bank of Canada, 2016; CIBC World Markets, 2016; Parliament of Canada, 2002; Statistics Canada, 2015a, 2015b, 2014.

Based on current usage rates, a conservative forecast of domestic consumption indicates a potential market of approximately $10 billion by 2036. However, research indicates the value of the Canadian market could be as much as double the aforementioned conservative estimate: according to CIBC World Market, the cannabis market in Canada could be worth as much as $10 billion. Figure 2 shows this high-end

estimate. See Appendix A for forecast calculation details.

Figure 2. High-end estimate of the number of cannabis users, potential size of legalized market



*Based on Canada-wide market value of $10 billion in 2016.
** Legal market size excludes consumption by individuals aged 17 and under.
Sources: Created by the author based on Bank of Canada, 2016; CIBC World Markets, 2016; Parliament of Canada, 2002; Statistics Canada, 2015a, 2015b, 2014.

Based on current usage rates, a high-end forecast of domestic consumption indicates a potential market of approximately $18.5 billion by 2036.

2. British Columbia's Cannabis Market

British Columbia (BC) is known to possess a large illegal cannabis industry (Easton, 2004; Hamilton, 2004). It is fast growing: data on electrical power usage and from police raids indicate that BC grow-ops had, on average, doubled in size between 2003 and 2010 (Diplock & Plecas, 2011). Data collected in areas that produce high volumes of cannabis in BC shows that the number of grow-ops has more than doubled in these settings (Plecas, Chaisson, & Garis, 2011; Plecas, Chaisson, Garis, & Snow, 2011).

There has been a significant societal shift away from criminalization and in favour of implementing a regulated framework for cannabis taxation and control in BC as well as in other Western jurisdictions (Emerson, 2011; Room, Fischer, Hall, Lenton, & Reuter, 2008; Wood, McKinnon, Strang, & Kendall, 2012). Such an approach would act to

reduce policing costs associated with prohibition (such as organized crime) while providing a significant source of tax revenues for provincial governments.

Market Size

Given its illegality, the exact size of BC's cannabis market cannot easily be estimated. However, most estimates range between $2 billion and $7 billion:

- An estimate based on the assumption that 16% of illegal indoor grow operations are caught by the police, puts the total value of BC's market for cannabis in the range of $2-7 billion (Diplock & Plecas, 2011; Easton, 2004); and
- A second estimate based on data on indoor cannabis cultivation in BC places the total value of the cannabis market at $3.6 billion annually (Diplock & Plecas, 2011).

These estimates include gross profits from domestic and export sales combined. The domestic component represents around 10% of the total industry: out of a market worth roughly $4 billion in 2012, approximately $407 million was consumed by BC residents (Werb et al., 2012). Accounting for inflation and population growth, provincial consumption in 2016 is estimated to be around $440 million (Bank of Canada, 2016).

Consumption

Werb et al. (2012) estimated, using data from the 2009 CADUMS and the 2009 Youth Smoking Survey, that the number of cannabis users in BC was 366,032 in 2009. Adjusting for population growth, the number of users in 2016 is estimated to be around 392,422. Table 1 shows the extrapolation of consumption findings to account for population growth between 2009 and 2016, while holding the percentage of users constant.

Table 1. Cannabis Consumption in British Columbia in 2016

Frequency	Percentage of Total	Users
Daily	21%	82,408
Weekly	27%	105,953
Monthly	23%	90,257
Less than Monthly	29%	113,802
Total number of users in British Columbia		392,422

Source: Created by the author based on Werb et al. (2012), BC Stats (2016).

Employment

For the same reasons that make official data on the size of the BC cannabis market inexistent, employment figures for the industry, the majority of which is illegal, are not easily captured. Employment in the cannabis industry is thus estimated by using Colorado, a state with a similar population size (5,456,574 versus BC's 4,683,139), as a proxy (BC Stats, 2016; The United States Census Bureau, 2016). As of 2015, approximately 16,000 individuals had been licensed to work in the cannabis industry. Adjusting for population, it is estimated that approximately 13,732 individuals work in the BC industry.

Employment figures are imprecise due to the illegal nature of the market. However, an estimate may also be made based on the size of BC's market for domestic consumption. According to an anonymous grower's account, it takes around 15 man-hours to produce one kg of cannabis. The employees involved in growing and processing cannabis, according to the grower's account, are paid around $25 an hour. If each employee works part-time, at 1,125 hours per year, this implies that given an annual production of 308,000kg in BC (40% of Canada's total, intended for domestic production alone), there are around 4,106 part-time individuals employed in the growing and processing segment, totaling $115.5 million in wages for that segment alone. This number represents a fraction of the total amount of employees involved in processing and growing, as it does not account for employment figures related to exports. The total figure is thus derived from estimating employment by comparing BC's illegal market to Colorado's legal market. However, the informal figures allow for total wage estimates. In addition to growing and processing, there are individuals involved in making secondary products like oils or edibles, account cloning, room turnover, trade work, sales, management, finances, legal, and cleanup. Given that the average wage for employees in

the cannabis trade is likely not as high as that for those involved in other parts of sale (legal, sales, finances), total wages are calculated based on $25/hour at full-time rates. This indicates that for the 13,732 individuals involved in the cannabis industry, wages are likely to be in excess of $618.1 million. For employment calculations, see Appendix B.

3. Potential Tax Revenues

Current drug policies have created substantial profits for drug dealers and producers; profits that could, were cannabis to be legalized, be partially transferred to the government's coffers. Stephen T. Easton (2004) estimates that cannabis production costs account for 17.44% of the final retail price in the illegal market. Profit margins of roughly 82% would be fleeting in a free market, as new entrepreneurs would be induced into the market, increasing drug supply[1] while driving down its retail price. However, in the illegal market, such a large profit has staying power because the possibility of facing jail time serves as a barrier to entry, creating an effective risk-premium for those who participate in the illegal production and sale of illegal substances (Flister, 2012).

Two taxation models could be applied in a legal cannabis market. Cannabis could be taxed at the same rate as regular goods and services, or at the higher rates applied to goods that are subject to sin taxes, such as liquor and tobacco. Both approaches are described below.

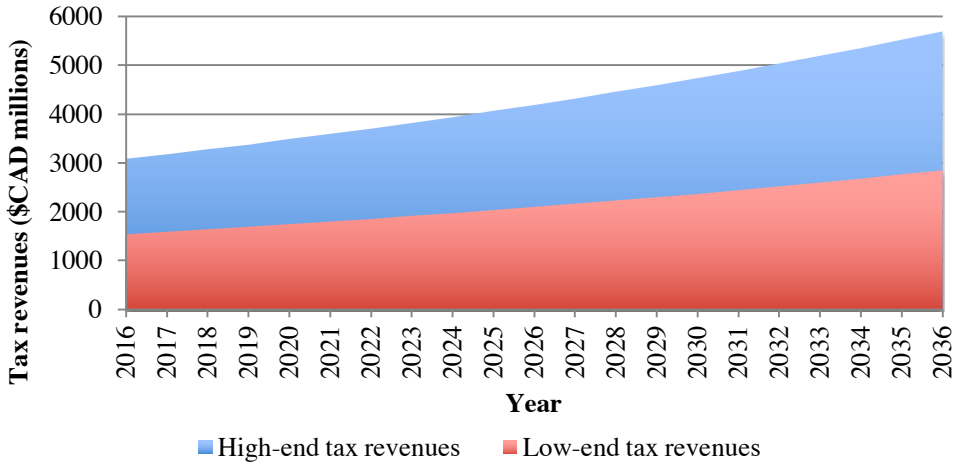
Regular taxation

Currently, taxes account for approximately 30.8% of Canadian GDP (OECD, 2016). If such a rate were applied to the legalized cannabis market, it would lead to growing annual tax revenues that would start at $1.54 billion and reach approximately $3.08 billion over the next two decades. At the provincial level, taxes account for approximately 12.1%; this could lead to provincial annual revenues ranging between $640 million and $1.28 billion. Figure 3 shows total potential tax revenues forecasted

[1] It is worthy of mention that this would not necessarily increase consumption; rather, supply would decrease to the equilibrium point – the level at which supply equals demand.

until 2036, based on a rate of 30.8%, estimated for both a $5 billion market (low-end estimate) and a $10 billion market (high-end estimate).

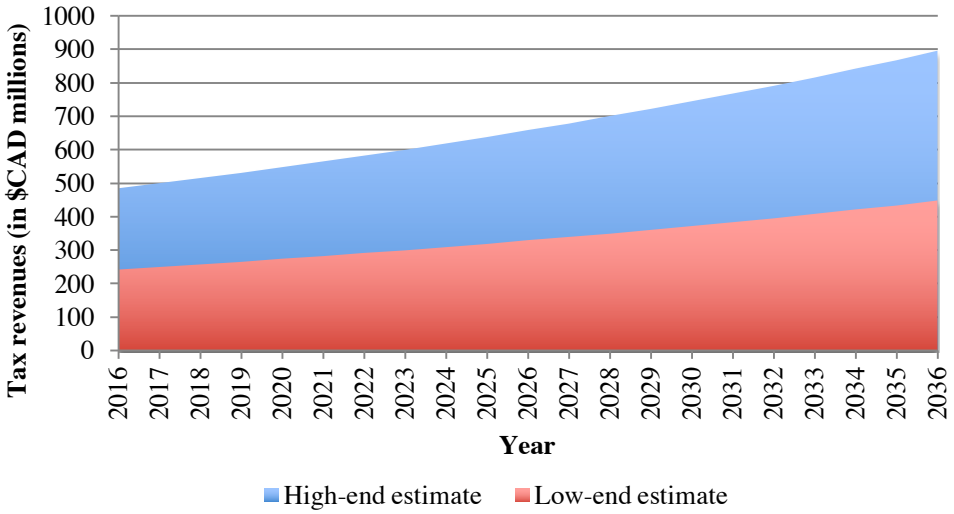
Figure 3. Total potential tax revenue 2016-2036 forecast – tax rate of 30.8%



Source: Created by the author.

BC is estimated to produce roughly 40% of Canadian cannabis (Canadian Business, 2013). A conservative estimates suggests that taxing legalized cannabis at the aforementioned rates would lead to tax revenues for the BC government ranging from $256 million to $512 million annually. This is based on BC's market being worth around $2 billion; however, research suggests that the real size of the BC market could be around $6-7 billion (Burgmann, 2012). This would lead to annual revenues between $768 million and $1.54 billion for the BC government. Figure 4 shows total potential tax revenues for the BC Government forecasted until 2036, based on a tax rate of 12.1%, estimated for both a $5 billion market (low-end estimate) and a $10 billion market (high-end estimate).

Figure 4. Total BC Government potential tax revenue – 2016-2036 forecast – tax rate of 12.1%



Source: Created by the author.

Given the BC government's anticipated 2016 budget of $48.1 billion, a 12.1% provincial tax on cannabis products would represent an annual increase of 1.6% to the government's tax receipts (Government of British Columbia, 2016a). While this may appear to be a modest increase, it would, for example, be more than sufficient to fund the BC Government's commitment to increase the Ministry of Health's budget, currently at $17.97 billion, by 3% annually (Government of British Columbia, 2016b).

Sin tax rates

The forecasts shown under *Regular taxation* assumed that cannabis would be taxed at a similar rate to that of other economic activities. This is not, however, the current practice for similar goods such as tobacco and alcohol. Such goods are typically subject to sin taxes. A sin tax is an excise tax specifically levied on goods considered to be undesirable, with the goal of increasing their final prices and raising new sources of government revenues. Government revenues raised over "undesirable" goods, however, are not always labeled as taxes. The BC Government, for example, applies a mark up of 124% to spirits, with a lower graduated markup for cost portions over $21/litre, and 89% to wine, with a graduated lower markup for cost portions over $11.75/litre (Government of British Columbia, 2015). Such high mark-up levels would not be recommended for

cannabis. As the cannabis market currently operates illegally, significantly increasing prices would undermine efforts to transition illegal activities into regulated, legalized ones. As such, initial markups should not have revenue raising as a first priority; rather, the priority at the initial time of legalization should be to starve the illegal market of cash flows, so that all illegal activity is eventually transitioned into the desirable regulated market.

It falls outside of the scope of this paper to estimate what the appropriate mark up for legalized cannabis products should be, as such rates depend on factors unique to the demographics of each province. Such factors include, but are not limited to, two main factors:

- Elasticity of demand: To what extent would an increase in price shift demand from the legal market to the illegal market? In evaluating this question, policy makers should account for the fact that elasticity of demand is not constant across all price points.
- The effect of legal punishment on illegal supply: To what extent do efforts to punish unregulated activities decrease illegal supply and increase prices in the illegal market? This would depend on two main factors: the likelihood of a supplier getting caught, and the costs (punishment) of getting caught.

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APPENDIX A – Forecast Calculation

User projections were calculated as follows:

- The percentage of individuals who, in 2012, reported having used marijuana at least once in the past 12 months – based on Statistics Canada (2015b);
- Yearly growth in the percentage of individuals who reported having consumed marijuana in the past 12 months in 2002 versus 2012. Yearly growth rate was calculated per age group (see Table 1) – based on Statistics Canada (2015b);
- Growth rate per age group is applied to the current Canadian population for each age bracket and forecasted for the next 20 years based on annual population growth of 1.1% - based on Statistics Canada (2015a, 2015b, 2014);
    - Forecasts are divided in five age brackets, based on anticipated growth or decrease in the number of individuals who consumer marijuana at least once a year in each bracket:
        - 15 to 17 years old – annual decrease of 3.48% in the percentage of users (20% in 2012);
        - 18 to 24 years old – annual decrease of 0.78% in the percentage of users (33.3% in 2012);
        - 25 to 44 years old – annual increase of 1.09% in the percentage of users (15.6% in 2012);
        - 45 to 64 years old – annual increase of 4.53% in the percentage of users (6.7% in 2012);
        - 65+ years old – annual increase of 14.87% in the percentage of users (0.8% in 2012).

Market size projections are calculated as follows:

- Based on CIBC's World Markets estimate that the current Canadian market for marijuana is worth approximately CAD$5 billion;

- Future forecasts are based on current estimated market size and adjusted for estimated number of users and annual inflation of 2% - inflation is based on the Bank of Canada annual inflation midpoint of 2% (2016).

APPENDIX B – Employment in BC

Employment in the cannabis industry is thus estimated by using Colorado, a state with a similar population size (5,456,574 versus BC's 4,683,139), as a proxy (BC Stats, 2016; The United States Census Bureau, 2016). As of 2015, approximately 16,000 individuals had been licensed to work in the cannabis industry. Adjusting for population, it is estimated that approximately 13,732 individuals work in the BC industry.

Employment figures are imprecise due to the illegal nature of the market. However, an estimate may also be made based on the size of BC's market for domestic consumption. An anonymous grower presented the following account:

> For every 50 1000w flowering lights I have one full time employee. If we say an average of 10 weeks, because I have always run longer flowering sativas, etc., then the total man-hours for 50 lights in flower is 400hrs.
> Vegetative stages are less costly. One employee at 25 hrs per week can take care of enough plants for 100 eventual flower lights. At 4 weeks veg, that adds another 100hrs, cut in half for 50 lights. That means that without setup, processing, management, or sales considered, 450 hours for 50 lights to harvest.
> Under ideal conditions, 1g per watt of light is the goal inside. This would mean a kilo per light. Let's lower that to 75%, because the ideal restricts variety, and because this is agricultural at its core so things happen. That means 75 kilos, or 165 lb. 450 divided by 75 brings it to six hours per kilo.
> The next consideration is processing and packing. The goal is to stay under $100/lb in processing costs. So add $220 to each kilo just for that, which is the equivalent of adding around 9 hours at $25 per hour, which is pretty standard.
> So, the total per kilo for growers and processors is about 15 man-hours per kilogram of cured product.
> This does not consider the use of trim to make secondary products like oils or edibles.
> (…) This is all estimated based on my personal experience, and doesn't take into account cloning, room turnover, trade work, sales, management, finances, legal, or cleanup. It also ignores any non-labour related costs.

The employees involved in growing and processing cannabis, according to the grower's account, are paid around $25 an hour. If each employee works 1,125 hours per year, this implies that given an annual production of 308,000kg in BC (intended for

domestic production alone), there are around 4,106 part-time individuals employed in the growing and processing segment, totaling $115.5 million in wages for that segment alone. In addition to growing and processing, there are individuals involved in making secondary products like oils or edibles, account cloning, room turnover, trade work, sales, management, finances, legal, and cleanup. Given the average wage for employees in the cannabis trade is likely not as high as that for those involved in other parts of sale (legal, sales, finances), total wages are calculated based on $25/hour at full-time rates. This indicates that for the 13,732 individuals involved in the cannabis industry, wages are likely to be in excess of $618.1 million.