11th Meeting of the Advisory Expert Group on National Accounts,
5-7 December 2017, New York, USA

Agenda item: 8.2

A cannabis economic account – The framework

Introduction

In response to the recent legislation to legalize, regulate, and restrict access to cannabis for non-medical purposes in Canada, a framework is being developed by Statistics Canada to measure the non-medical use of cannabis within the framework of the System of National Accounts.

Currently Statistics Canada is preparing the statistical system to be able to capture the economic and social activities related to the non-medical use of cannabis. Given the fact that significant non-medical use currently exists in Canada it is incumbent upon the agency to try to measure the production, sale and use pre-legalization—despite the obvious difficulties of doing so—as well as post-legalization in order to provide Canadians, governments and businesses with as clear a picture as possible of the economic and social consequences of the legalization.

Documentation

Paper on: A cannabis economic account – The framework

Main issues to be discussed

The AEG is requested to:

- Provide their views on the framework for cannabis economic accounts.

Latest Developments in the Canadian Economic Accounts

A cannabis economic account – The framework

Released November 21, 2017 in *Latest Developments in the Canadian Economic Accounts*, Catalogue no. 13-605-X

A cannabis economic account – The framework

Canada's society and economy continue to grow and evolve. Statistics Canada strives to keep its programs up to date with changing trends and circumstances to ensure Canadians are well informed about current developments. This means Statistics Canada has to innovate and invest in the statistical system continuously. The prospective legalization of cannabis means Statistics Canada needs to start preparing Canada's statistical system to capture the associated economic and social implications.

On April 13, 2017 the Government of Canada tabled legislation in the House of Commons to legalize, regulate and restrict access to cannabis for non-medical purposes. If legislation is approved by Parliament the drug's new status might come into effect by mid-2018.

The non-medical use of cannabis currently exists in Canada but is not captured by the statistical system. There is a lack of available information from which to compile reliable estimates. Once cannabis is legalized the majority of the production, sale and use of cannabis will move from "underground" to "above ground" making it easier to capture and report. Currently Statistics Canada is preparing the statistical system to be able to capture the economic and social activities related to the non-medical use of cannabis.

Given the fact that significant non-medical use currently exists in Canada it is incumbent upon the agency to try to measure the production, sale and use pre-legalization—despite the obvious difficulties of doing so—as well as post-legalization in order to provide Canadians, governments and businesses with as clear a picture as possible of the economic and social consequences of the legalization.

The system of national accounts

This paper presents a framework within which experimental (modelled) estimates of cannabis-related economic activity will be developed. The framework is called a cannabis economic account. The foundation of this account is the Canadian System of Macroeconomic Accounts (CSMA). The CSMA is based on the 2008 System of National Accounts (SNA 2008), an internationally recognized framework used to measure economic activity within a country or region. The framework is used by countries all over the world to record the production, incomes, investment, consumption, financial transactions and stocks of non-financial and financial assets for various sectors and industries operating in a given economy. The statistics are organized in a sequence of accounts that articulate the change in wealth from one period to another by tracing the activities of economic agents (households, governments, corporations). SNA 2008 provides a set of concepts, definitions, classifications and accounting rules for compiling and integrating data to give a comprehensive picture of the economy and how it works. Key measures that emerge from this framework include measures of gross domestic product (GDP), household consumption, investment, capital stock, productivity, the balance of international payments and government debt.

Cannabis economic account

One of the strengths of the System of National Accounts framework is its flexibility. While the system lays out the concepts and structures with the accounting rigour required to produce a set of integrated and internally consistent accounts, it also affords the flexibility to vary and in a sense "expand" the framework to address specific needs. There are essentially two ways these accounts can be "expanded". One involves rearranging the classifications (e.g. presenting more detail or alternative aggregations) and/or adding complementary information. The expansion does not change the underlying concepts of the core framework but provides a broadened perspective on a particular sector, group of products or activity. The second type of expansion seeks to change the underlying concepts or boundaries of the core System of National Accounts. This could involve, for example, changing the concepts of production (e.g. including volunteer activities), consumption (e.g. including consumption of services produced by the household itself, such as cooking and cleaning) or capital formation (e.g. including investment in human capital).

A cannabis economic account can use both of these expanding techniques. Currently the non-medical use of cannabis is not included in Canada's monthly, quarterly and annual estimates of GDP, household consumption and other key macroeconomic indicators. A cannabis economic account can extend the current production and consumption boundaries to include the currently illegal production, sale and consumption of cannabis. Second, Canada's industry and product classifications currently do not have separate categories for cannabis industries or products. For example, the North American Industrial Classification System (NAICS) does not have a cannabis greenhouse industry, but does have a vegetable greenhouse industry. A cannabis economic account will use a provisional set of industry, product and expenditure classifications to categorize the production and consumption activities of both medical and non-medical cannabis producers.

Below are the titles of the industry, product and expenditure categories that will be used to construct the account. These classifications are different from the industry, product and expenditure classifications that are likely to be the standard ones once cannabis is legalized. The classifications that will be implemented post-legalization will have a more traditional structure and will, for the most part, combine the medical and non-medical production into a single industry and product structure. The classifications chosen for the cannabis economic account were designed to help users better understand the transition from illegal production and consumption to legal production and consumption. For example, the decision to break the industry into separate medical and non-medical components and the expenditure category into separate medical and non-medical ones is because prior to legalization the way both "industries" operate is fundamentally different. Distinguishing between the two is analytically useful and helps users more easily assess the quality of the estimates.

Industry classification

Cannabis industry

- Medical cannabis industry
- Non-medical cannabis industry

Product classification

Cannabis products

- Dried cannabis
- Cannabis oil
- Fresh cannabis
- Cannabis plants and seeds
- Other cannabis products

Expenditure classification

Household expenditure on cannabis

- Household expenditure on medical cannabis
- Household expenditure on non-medical cannabis

Compiling a cannabis economic account

The development of a cannabis economic account is a challenge because of the lack of information available since both the production and consumption of non-medical cannabis are presently illegal in Canada. There is strong evidence from health surveys and justice statistics that there is significant illegal production, distribution and consumption occurring in Canada and this has been the case for the last 50 to 60 years at least, but there are few if any related economic data that have been developed over this period. The lack of economic data for the non-medical market implies that models and assumptions need to be developed that take information on use prevalence from health and justice surveys and translate this prevalence into rough estimates of output and consumption. This means any estimates that are produced are model-derived, relying on assumptions with wide margins of error, and at best can provide upper/lower bound measures.

While a cannabis economic account can present a gauge of the output and consumption of non-medical cannabis, it should not be assumed this information can simply be added to existing measures of GDP to arrive at a measure of total economic activity in Canada including illegal cannabis. A significant portion of the activity associated with illegal cannabis production and consumption may already be included in Canada's estimate of GDP, misallocated to other industries, products or expenditure categories.

Statistics Canada is not yet able to estimate the amount of the illegal output and consumption that should be added to the official estimates of GDP. Further research is being undertaken. It is Statistics Canada's intention to include illegal cannabis production and consumption in Canada's national economic accounts for periods prior to the one in which non-medical cannabis is legalized to ensure a consistent set of economic statistics.[1] However, the agency will not do so until the accounts undergo their normal revision in November 2019, well after cannabis has been legalized (assuming Parliament approves the necessary legislation). By this time good survey and administrative data[2] will be available on the product and cost structure of the newly legal cannabis industry and this information will form the basis for improved backward projections of illegal cannabis output and consumption prior to legalization.

Information related to the output and consumption of cannabis for medical purposes poses less of a challenge. The information is currently contained within Canada's economic accounts but is not visible due to the fact that these activities are comparatively small in dollar terms and are grouped with other related activities. For example, household spending on medical cannabis is included with household spending on other medicines. Estimating the output and consumption of medical cannabis therefore involves extracting existing detail related to the medical cannabis sector from the core set of existing national accounts statistics. This involves using information from the 70 plus licensed medical cannabis producers in Canada and regrouping the information into a medical cannabis industry.

Aside from comparability and efficiency, the use of the existing national accounts infrastructure also provides a number of other advantages. A large base of survey and administrative data is already in place at Statistics Canada that is used to construct and update the CSMA. These data can be used as the starting point in the construction of a cannabis economic account. The data have already gone through a quality validation process in the measurement of the core CSMA and have been further integrated, reconciled and balanced in the process of producing the CSMA.

A cannabis economic account can include information related to output, inputs, incomes and employment. This structure provides an easy and convenient way to understand and analyze the cannabis industry that is comparable with the rest of the economy. It also provides a coherent framework within which to incorporate additional information about the economics of cannabis as that information becomes available gradually over the next couple of years.

A cannabis economic account can also provide clarity for users, who appreciate the fact that the account puts a standard boundary around cannabis economic activity and helps ensure everyone is working from the same set of statistics rather than a variety of estimates based on different concepts and methodologies.

Finally a cannabis economic account is expandable in the sense that work can be undertaken to disaggregate a given dimension (such as an industry or product class) in order to provide additional granularity for data users. For example, the account could expand an "other cannabis products" class into a finer level of detail if that is required by users.

Sources and methods: medical cannabis

The consumption of cannabis for prescribed medical purposes has grown substantially in recent years. Health Canada first established regulations on access to cannabis for medical purposes in 2001. This regulatory framework has undergone a number of changes since then, most notably in 2014 and 2016.

Currently there are 73 licensed producers serving this market (as of November 15, 2017). The number is growing rapidly in anticipation of the legalization of cannabis for non-medical use in mid-2018. The licensed producers advertise their products on web sites and fill prescriptions by mail. The clients submit their prescriptions to licensed producers online or by mail. There are no retail or wholesale intermediaries and no sales or excise taxes. Importation and exportation of cannabis for medical purposes is rare and requires special circumstances (e.g. research projects) and government permits.

It is relatively straightforward to develop a set of economic accounts for this market. Administrative data are available on output, sales and inventories in volume terms from monthly reports submitted to Health Canada by the licensed producers. Corporate income tax data are

also available for these producers, although with a significant lag. In addition, Statistics Canada is conducting a pilot survey of this group of producers that will provide information about their dollar sales, expenses, profits, investments and product lines. Statistics pertaining to the production, distribution and consumption of medical cannabis will be both complete and of high quality.

Sources and methods: non-medical cannabis

Unlike the medical cannabis industry, however, there are few economic data related to the output and consumption of illegal non-medical cannabis in Canada. Accordingly the illegal cannabis industry will be modelled using health-related statistics as a starting point. This section highlights the data sources, methods and models that will be used to derive the part of the cannabis economic account focussing on illegal output and consumption.

Non-medical cannabis: estimates of Canadian household expenditures

Fortunately, Canada has collected a significant amount of information from Canadian households over the last 50 years related to cannabis consumption (both medical and non-medical). This information can be used to develop a time series of cannabis use prevalence among Canadians.

These prevalence measures are the starting point for the part of the experimental cannabis economic account pertaining to non-medical cannabis consumption and production. Fortunately, the statistical building blocks required to measure non-medical cannabis consumption and production are relatively straightforward.

Suppose the objective is to measure the value of cannabis consumed by Canadians in a given year. Three essential pieces of information are required—the use prevalence or number of consumption episodes per year, the volume consumed per consumption episode and the price. Use prevalence is the number of people who consume combined with the frequency with which they consume. This information is available from the health surveys mentioned and has been used by the Parliamentary Budget Office to estimate illegal cannabis consumption.[3,4] To turn the prevalence into an estimate of the volume of cannabis consumed an estimate of the amount of cannabis consumed during a typical consumption episode is required. For example, if the prevalence measure indicates that one million Canadians consume cannabis on a daily basis, then to derive a volume measure for the year the number of grams consumed daily must be multiplied by the number of days in the accounting period, 365 in the case of a year. Assume for example that on average Canadians who consumed cannabis each day consumed one gram per day. Finally, the third piece of information required to derive a measure of household expenditure on cannabis is the price paid per unit. In the example, to calculate expenditure an average price per gram is required. Assume the average price in the year was $8 per gram. Then the calculation of household expenditure on cannabis for the year is as follows:

1,000,000 (number of people) * 365 (number of consuming days) * 1 (grams consumed per consuming day) * $8.00 (price per gram) = $2,920,000,000.

The method outlined above is the method that will be used to construct the measure of household consumption in value terms in the cannabis economic account.

The derivation of household consumption in value terms can be summarized algebraically in the following equation:[5]

$$C = P \times Q = P \times \sum_i (Pop_i \times \sum_j (Days_j \times Grams_j))$$

where,

C = Value of total household consumption of cannabis (expenditure) in the period.
P = Average price of cannabis in the period.
Q = Quantity of cannabis in the period.
Pop_i = Consuming population in demographic group *i* in the period.
$Days_j$= Number of consuming days in frequency-of-use category.
$Grams_j$ = Average grams per day consumed by a user in frequency-of-use category *j,* to be determined.
The frequency-of-use categories are *j* = once a year, less often than once a month, one to three times a month, at least once a week, daily.

Non-medical cannabis: deriving estimates of output, gross domestic product, imports and exports

There is no debate that non-medical cannabis is produced in Canada. A quick review of the justice statistics points to raids on grow houses and other illegal production facilities. Even though this activity is illegal, it is still "economic output" and according to the international SNA 2008 standard should be included in Canada's GDP. However, the output and distribution of cannabis have always been excluded from Canada's measure of gross domestic product because it was assumed to be relatively insignificant and there were limited data available to produce accurate measures. While the problem of limited information still exists, the insignificance argument (both as a social phenomenon and as an economic one) no longer holds. It is time for Canada's gross domestic product to include the activity. Yet, prior to legalization the limited source data problem persists.

The legalization of cannabis should eliminate or substantially restrict the illegal cannabis market, but if that occurs it will take time. While the adjustment proceeds there will be an interest in measuring the rate of progress toward the objective. Moreover, there will be an overstatement of economic growth in the estimates of GDP in the initial months and quarters after legalization, as measured legal output substitutes for some of the previously unmeasured illegal output. For both of these reasons there will be a continuing need for estimates of illegal cannabis output and consumption for the next couple of years or so.

Fortunately, there is a direct relationship between household consumption expenditure and the output of cannabis and this relationship will be exploited along with some realistic assumptions to develop a model to estimate the domestic output, imports and exports of non-medical cannabis in Canada.

The model is built on a cornerstone national economic accounting identity: that the supply of a product to an economy must equal its use by that economy. More explicitly, within the Canadian macroeconomic accounting framework any good that is supplied to the economy, through either domestic output or imports, has a limited number of uses, namely:

- As an input to the output of other goods and services—referred to as intermediate consumption.

- As consumption by households as part of final consumption expenditure.
- As consumption by governments or non-profit institutions serving households in the provision of their services.
- As a source of wealth (capital) in which case it is used repeatedly over the course of more than a year in the production of other goods and services.
- As inventory.
- As exports.

In the case of non-medical cannabis, it is unlikely that a significant amount of the illegal drug is an input into subsequent processing and therefore for the purposes of our model it is assumed that it does not enter intermediate consumption.[6] It is further assumed that governments and non-profit institutions serving households do not purchase non-medical cannabis in significant quantities as an input into the production of their services. Cannabis is not used as a capital asset to produce other goods and services. Changes in the amount of illegal cannabis held in inventory may sometimes be significant, as a result of large drug busts for example, but over a period of several years inventory fluctuations are likely to cancel out and be unimportant. Given this, our model will assume that prior to legalization there are only two uses for non-medical cannabis—the cannabis that is produced in Canada or imported (smuggled) into Canada is either consumed by households or illegally exported. This is an important assumption since it means that the output problem reduces to an equation of four variables with only three unknowns because the level of household expenditure can be estimated from the use prevalence data as previously discussed.

The relationship between the supply of cannabis and the use of cannabis is illustrated in Figure 1 where the goal is to determine the supply of non-medical cannabis in the Canadian market along with the use. The supply can come from two sources—domestic output or imports. The uses as mentioned above can be either household consumption or exports.

Figure 1 Relationship between the supply of cannabis and the use of cannabis

Supply (millions of dollars)			Use (millions of dollars)	
Domestic output	Imports	=	Household expenditures	Exports

Source: Statistics Canada, "A cannabis economic account", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

The supply=use equation requires that some household expenditure come from domestically produced non-medical cannabis and some from illegal imports. In addition, some domestically produced cannabis is illegally exported from Canada to other countries. In order to develop a full cannabis economic account, the import and export of non-medical cannabis into and out of Canada must be addressed.

Currently, there are no data available to indicate the amount of non-medical cannabis illegally imported into or exported out of Canada. The only information available are justice statistics related to seizures and arrests. The Canadian Center for Justice Statistics tracks the number of incidents related to violations of the *Controlled Drugs and Substances Act* and categorizes these incidents as output, importation and exportation, trafficking and possession. Unfortunately import and export seizures are not reported separately. Nevertheless, it may be possible to

make some reasonable assumptions about the relative importance of illegal imports and exports by examining these data.

Given assumptions about imports and exports and estimates of household consumption expenditure it will be possible to solve the supply=use identity for output at purchaser price. To derive a measure of gross value added at basic price additional information is required. In particular, information is needed about (i) how much of domestic output is for own use rather than for sale on the illegal market, (ii) the margins associated with distributing and selling cannabis and (iii) the cost of the inputs used to produce cannabis. This national accounting terminology will now be explained.

Gross value added is defined as the value of output less the **intermediate inputs** that are required to produce the output. The value added related to non-medical cannabis can therefore be seen loosely as the value of the cannabis sold less the costs of the inputs. The intermediate inputs include costs related to the operation of the facility used to grow cannabis (electricity, water, fertilizer, etc.), costs associated with the purchase of seeds or plants and costs associated with renting facilities and equipment. Gross value added represents the contribution of labour and capital services to the total value of the cannabis produced as distinct from the value of purchased inputs which are, of course, the value added of producers of products other than cannabis.

When cannabis output is said to be measured **at basic price** that means it is valued at the price charged at the factory gate, before any wholesaling, retailing ("street dealer") and other margins are added into the price. In order to calculate gross value added at basic price the margins must be removed from the value of domestic output **at purchaser price,** in which the margins are included.

Production of cannabis for own final use refers to the non-medical cannabis that is grown by a grower and consumed by that same grower. Own-use consumption is common in the agriculture industry where, for example, farmers may raise chickens for sale on the market but also slaughter chickens for their own family's consumption. The same is the case for cannabis—there are Canadians who grow cannabis and process the plants for their own use.

To move from domestic output at purchaser price to a measure of output for sale at basic price, the following must be estimated:

- margins;
- intermediate consumption; and
- shares of output that were produced for sale and for own final use.

Margins charged in the Canadian illegal cannabis industry are unknown. They might be higher than those in the legal medical cannabis industry, due to the risk premium associated with engaging in illegal activity, but this is difficult to determine. Different assumptions about margins can be used to estimate upper and lower bounds for gross value added at basic prices.

To calculate value added for the illegal industry, the estimated value of the intermediate inputs used to produce cannabis is required. Again, since there are no data available for the various inputs used to produce non-medical cannabis, proxies and assumptions must be relied on. The medical cannabis industry input proportions could be used as a proxy for the non-medical cannabis industry. This would be defensible to the extent that similar inputs are required to produce cannabis whether the process is legal or illegal—seeds, fertilizers, water, electricity, etc. However, the assumption could be problematic to the extent that legal producers face some costs not faced by illegal producers, such as the costs of complying with regulations. Statistics

Canada has limited information on the structure of the medical cannabis industry at present, but is conducting a survey to obtain more detailed data. This information can be used to estimate the ratio of inputs to outputs. Assuming the production process for illegal non-medical cannabis is similar to that for legal medical cannabis would allow the input-to-output ratio for the medical industry to be applied to the non-medical industry to derive a measure of value added.

Once the levels of output and intermediate consumption have been estimated it must be determined how much of the output was produced for own use (non-market output) and how much for sale in the market (market output). To estimate this split a proxy from the medical cannabis industry is once again a good proxy. Canadians who use medical cannabis can obtain a permit to grow their own cannabis or they can purchase cannabis from a licensed Canadian producer. To grow your own cannabis for medical reasons a certificate from Health Canada is needed. Health Canada also obtains information from licensed growers who sell to the public. Health Canada therefore has data on the percentage of medical cannabis consumers that use grown-for-own-use and the percentage that use purchased-on-the-market cannabis. The same proportions can be used as a proxy for the non-medical market. On the one hand, this ratio might be expected to be lower in the illegal market, because of the legal risks of being caught growing cannabis on your own. On the other hand, though, one might expect the ratio to be higher in the illegal market since growing one's own cannabis allows the consumer to avoid the risks associated with illegal purchases, including the risk of unknowingly purchasing a contaminated product and the risk of getting caught by the police while making a transaction.

Bringing all this information together makes it is possible to estimate the output of non-medical cannabis in Canada along with the corresponding gross value added, margins, imports and exports.

Algebraically these calculations can be summarized as follows:

$$Y_{purch} = C + X - M$$

$$Y_{basic} = Y_{purch} \times (1 - DM)$$

$$GVA = Y_{basic} \times (1 - IC_{share})$$

$$Y_{basic} = NM \times Y_{basic} + (1 - NM) \times Y_{basic}$$

where,

C = total household expenditure on legal and illegal cannabis.
X = legal and illegal exports of cannabis.
M = legal and illegal imports of cannabis.
Y_{purch} = total output at purchaser price.
Y_{basic} = total output at basic price.
DM = dealer margins including trade, transportation and tax margins.
GVA = gross value added.
IC_{share} = share of intermediate consumption in total output at basic price.
NM = share of non-market output (for own use) in total output at basic price.

The cannabis accounts

The sources and methods outlined above will yield a number of useful integrated tables that will be available to users to help them understand the cannabis market in Canada. These tables will record the production, consumption and distribution of both medical and non-medical cannabis for as long a time period as possible. These tables include:

- production account;
- income account; and
- goods and services account.

The production account records the production of cannabis in Canada. It distinguishes between non-medical and medical production. It measures the inputs required to produce cannabis and the industries value added owing to the production of cannabis. The key measure contained in the production account is gross value added at basic price. The form of the production account is illustrated in the following table:

Table 1
Production account

	Non-medical industry	Medical industry
Output		
Dried cannabis	Not applicable	Applicable
Cannabis oil	Not applicable	Applicable
Fresh cannabis	Not applicable	Applicable
Cannabis plants and seeds	Not applicable	Applicable
Other cannabis products	Not applicable	Applicable
Total cannabis products	Applicable	Applicable
Intermediate consumption	Applicable	Applicable
Gross value added at basic price	Applicable	Applicable

Source: Statistics Canada, "A cannabis economic account", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

The income account shows who receives the income from the production of cannabis in Canada. Within the macroeconomic accounting framework, incomes accrue to factors of production (capital and labour) or can be appropriated by governments in the form of taxes less subsidies. In the case of non-medical cannabis, it will be assumed that all income is mixed income—meaning it is income accruing to households (rather than corporations) and it is not possible to distinguish between the income owing to the capital input and the labour input. It is possible some of the activity could be hidden in the corporate sector, but this simplifying assumption will not significantly impact the estimates. In the case of medical cannabis, the

labour income accrues to the households supplying the labour and the capital income accrues to corporations (the licenced producers) who own the capital. The form of the income account is illustrated in the following table:

Table 2
Income account

	Non-medical industry		Medical industry	
	Households	**Non-financial corporations**	**Households**	**Non-financial corporations**
Gross value added at basic price	Applicable	Not applicable	Applicable	Applicable
Wages and salaries	Not applicable	Not applicable	Applicable	Not applicable
Employers social contributions	Not applicable	Not applicable	Applicable	Not applicable
Compensation of employees	Not applicable	Not applicable	Applicable	Not applicable
Mixed income	Applicable	Not applicable	Applicable	Not applicable
Gross operating surplus	Not applicable	Not applicable	Not applicable	Applicable
Taxes less subsidies on products	Not applicable	Not applicable	Applicable	Applicable
Taxes less subsidies on production	Not applicable	Not applicable	Applicable	Applicable
Margins	Applicable	Not applicable	Applicable	Not applicable
Gross value added at purchaser price	Applicable	Not applicable	Applicable	Applicable

Source: Statistics Canada, "A cannabis economic account", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

The goods and services account shows how cannabis is supplied to and used in the Canadian economy. The goods and services account has two “sides”—a supply side and a use side. The key measure that emerges from this account is a measure of cannabis GDP. This is greater than the gross value added of the cannabis industry since it embodies all of the contributions of downstream industries in the production of cannabis (such as the value-added of electricity producers related to the supply of electricity to cannabis producers). The form of the goods and services account is illustrated in the following table:

Table 3
Goods and services account

	Supply				Use				Cannabis gross domestic product (GDP)
	Domestic production	Imports	Margin	Total supply	Household expenditure non-medical	Household expenditure medical	Exports	Total use	
2007									
2008									
2009									
2010									
Year ***n***									

Note: This table is a template showing the general structure of the account. Year 2007 and up to *n* are fictitious examples for illustrative purposes only.
Source: Statistics Canada, "A cannabis economic account", *Latest Developments in the Canadian Economic Accounts* (13-605-X), 2017.

Conclusion

The cannabis economic account framework is Statistics Canada's first step towards publishing economic statistics related to the output, consumption and distribution of medical and non-medical cannabis. It will be used to develop rough estimates in the months ahead. The data that will be released as part of the cannabis economic account should be considered as experimental in nature and will be revised as more information is made available over the coming years. While the estimates cannot be considered precise, they will provide users with lower and upper bounds between which the cannabis "sub-economy" can be placed within the context of the overall Canadian economy. Statistics Canada will build the statistical infrastructure necessary to develop more detailed, timely and higher quality estimates. As always, the agency relies on partnership and cooperation of Canadians to provide Statistics Canada the information it needs to better inform the general public, businesses and governments.

Appendix A

Medical Cannabis Producers Survey, 2016 (new survey). The Medical Cannabis Producers Survey is a special survey of the 73 licensed medical cannabis producers in Canada. The survey is collecting information related to production (inputs and outputs), inventories, investment, employment and intentions related to entry into the non-medical market. Data are being collected for fiscal years 2015/2016 and 2016/2017.

Industrial producer prices (additional detail). Starting in September 2017, Statistics Canada will begin collecting prices from the medical cannabis producers using prices quoted on licensed

producers' web sites. This information will be used to begin construction of a medical cannabis price index as well as help Statistics Canada understand the evolution of the price as it moves from a medical-only market to a combined medical and non-medical market.

Canadian Tobacco, Alcohol and Drugs Survey (existing survey for 2017). The Canadian Tobacco, Alcohol and Drugs survey measures the prevalence and frequency of cigarette smoking, as well as behaviours related to smoking, the prevalence and frequency of alcohol use, the prevalence of drug use and the extent of harm related to usage. A key addition to the 2017 cycle is the addition of a number of questions related to the use of cannabis for both medical and non-medical purposes. This will be the main source of information that will be used to measure the volume of cannabis use.

International merchandise trade data. The international merchandise trade statistics program captures the detailed import and export transactions of the cannabis producers (and firms licensed to sell medical cannabis). Transactions related to these producers will be extracted to determine their international trade activities. All such transactions, which are uncommon, require special permits and pertain to cannabis for use in research or specific medical use. Canada is party to international conventions limiting drug trade.

Government finance statistics. The government finance statistics will be used to obtain measures of government expenditures related to the health and justice aspects of cannabis such as policing and abuse prevention.

Taxation statistics. Data from T2 forms (corporation income statement and balance sheet information compiled by Canada Revenue Agency) and T4 forms (statements of remuneration paid to individual employees compiled by Canada Revenue Agency) will be extracted for the producers to build a time series of information related to their production, labour compensation expenses and stocks of financial and non-financial assets.

Regulatory information. Health Canada currently collects information from the licensed producers. Statistics Canada will acquire these data and ensure any additional collection activities do not duplicate what Health Canada is already collecting.

Rapid Response Household Survey. A quarterly household survey will be conducted in 2018 (all four quarters) to obtain information related to household cannabis consumption and expenditures in each of the quarters (two quarters prior to legalization and two quarters following legalization).

Consumer prices. The retail price (or street price) will be taken from the website Price Of Weed (www.priceofweed.com). This website has been collecting self-reported prices for cannabis by region in Canada since 2010. This information will be combined with the volume estimates developed from the Canadian Tobacco, Alcohol and Drug Use survey to develop estimates of expenditures on cannabis.

Notes

1. Some other countries, notably in Europe, have included estimates of illegal activity in their core national accounts estimates for a number of years, in line with international guidelines regarding the production boundary.

2. Administrative data refer to information collected by government agencies and/or private sector companies in support of their operations. Examples include records of births and

deaths, taxation records, records about the flow of goods and people across borders, and data collected by satellites.

3. Office of the Parliamentary Budget Officer, Legalized Cannabis: Fiscal Considerations, November 1, 2016.

4. The most recent of these surveys is the 2012 Canadian Community Health Survey—Mental Health (CCHS-MH) conducted by Statistics Canada. The Canadian Tobacco, Alcohol and Drugs Survey being conducted in 2017 will also include use prevalence information.

5. This formulation assumes there is one cannabis product with price P. It could easily be expanded to allow for multiple cannabis products, each with its own price, but it would of course be difficult to obtain data for the illegal market on this basis.

6. It is possible that cannabis plants and seeds that are produced by one illegal business are sold to another that uses these plants and seeds as inputs in subsequent production (such as the production of illegal muffins, cakes, etc.). For purposes of this study it is assumed to be relatively minor and is excluded from the model. This activity may become more significant after legalization.