



Economic Impacts of the Maple Syrup Industry in Ontario

Final Report

Ontario Maple Syrup Producers Association (OMSPA)

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Executive Summary

In 2011, the maple syrup sector in Ontario consisted of 2 755 businesses that produced 3.9 million litres of bulk maple syrup, 85% of which was bottled into small recipients or processed into maple goods. In 2011, this sector created a total of 1 468 full-time equivalent (FTE) jobs and \$41 million in total gross domestic product (GDP) in Ontario. Another 112 FTEs and \$12.3 million in GDP resulting from Ontario's maple sector were created in other Canadian provinces. When accounting only for taxes collected in Ontario, the sector generated \$9 million of taxation revenues for the federal, provincial and municipal governments. All of these figures take into account the direct, indirect and induced effects of the production and processing of maple syrup in Ontario.

Ontario has a vast potential for further development of its maple syrup sector through expansion on Crown land. Whereas the maple sectors in Quebec and New Brunswick have access to 11 and 8%, respectively, of sugar maple dominant forests on public land, Ontario made only 0.04% available for maple syrup production in 2011. If the utilization rate of sugar maple dominant forests were the same as in the state of Vermont (which has a maple sector similar to Ontario's), approximately 2%, about 13 000 additional hectares, could be tapped on Ontario's Crown land, which would double the total volume of maple syrup production in the province of Ontario.

The survey conducted for this study allowed to estimate a total production of 3.9 million litres of maple syrup in 2011 in Ontario. This is 1.7 times higher than the estimates (2.2 million litres) provided by Statistics Canada(2011).

The present study was mandated by the Ontario Maple Syrup Producers Association (OMSPA) and conducted by ÉcoRessources Inc. The results of the intersectorial model were not rounded off, but nevertheless show orders of magnitude based on the most realistic assumptions possible, rather than precise measurements.

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ÉcoRessources Inc specializes in the economics of natural resources and the environment and brings together experts with strong policy-making and economic analysis backgrounds. Its core research staff and senior collaborators make up a team of high-level experts working in the fields of agrifoods, energy and climate change. Many clients – both public and private – from a wide array of sectors, including agriculture, energy, forestry, mining, waste management, transportation, food-processing, oil and chemical sectors, seek the expertise of ÉcoRessources to improve policies, to lead strategic development initiatives and processes, and to advise them on the marketing of their products.

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ÉcoRessources thanks the numerous producers, industry representatives and government officials who generously provided data, information and insight into the maple syrup industry in Ontario. Their contributions greatly improved this report and ÉcoRessources sincerely hopes that the ensuing results will facilitate decision-making and generate insight into the importance of this sector for Ontario's economy.

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1. Introduction

According to Statistics Canada, Ontario maple syrup producers produced approximately 2.2 million litres of maple syrup in 2011, valued at \$32 559 million¹. Ontario is the province that produces the second largest volume of maple syrup in Canada, following Quebec and ahead of New Brunswick². Indeed, in a study conducted in 2010 for the Fédération des producteurs agricoles du Québec (FPAQ), ÉcoRessources found that the maple sugar industry in Ontario has a strong development potential, especially on Crown land. Moreover, apart from its current economic importance, the sector has an important historical and cultural value, especially in the rural regions.

The Ontario sector is characterized by a tendency towards adding value through specialty products such as maple butter, candies, taffy and gourmet products. Furthermore, it has a competitive advantage in its proximity to important urban centres and the United States market. Maple syrup festivals held in various towns and villages show the upward cultural and economic dynamics of an industry that is far from having reached its full potential.

The Ontario Maple Syrup Producers Association (OMSPA), the main representative body of maple syrup producers in the province, counts approximately 400 members. The Association provides them with information, network services and training. It also represents the maple syrup sector at various levels of government alongside private and academic partners. It provides consumers with information on the benefits of using maple products and on where to obtain locally produced maple syrup.

¹ Statistics Canada, 2011. <http://www.statcan.gc.ca/pub/23-221-x/2011000/t002-eng.htm>

² In 2012, ÉcoRessources conducted a study comparing the economic impacts of the use of Crown land maple resources of the maple syrup industry and the hardwood products industry in the province of New Brunswick. The study estimated that in that province, the maple syrup industry creates on average 2 to 3 times more FTEs, 4 to 5 times more wealth and 2 to 3 times more tax revenues than the hardwood products industry on 100 ha of NB Crown land. This comparison is specific to the economic activities on Crown land in NB and is bound to the methodology and assumptions presented in the same study.

In order to strengthen its analysis of sector trends and future needs, the OMSPA wants to obtain a thorough understanding of the economic impact of the Ontario maple syrup industry as a whole and of the eastern Ontario region specifically. The present study aims to provide this understanding by answering the following research questions:

- What are the current economic impacts (direct, indirect and induced) of the maple syrup sector in the province as well as in four specific regions within the province in terms of:
 - Sales (output production)?
 - Jobs (full-time equivalents, FTEs)?
 - Contribution to the provincial Gross Domestic Product (GDP)?
 - Taxation revenues for municipal, provincial and federal governments?
- What are the economic impacts of complementary activities such as pancake houses and maple syrup festivals in the province?
- How important is the maple syrup products sector compared to other sectors in Ontario?
- What are the characteristics of current production in terms of number of producers, areas, taps, volumes and business scale?
- What is the expansion potential of the sector on Crown land?

In the first section of this report, a portrait of the sector, together with a general discussion of its structure, dynamics and stakeholders, is presented. Next, the methodology used for obtaining data and modelling it into economic impacts is presented and, finally, the results of the modelling and their analyses are presented.

2. Overview of the maple syrup industry in Ontario

2.1 The maple syrup industry in Ontario

Size of the maple sector

Ontario ranks second among the Canadian provinces producing maple syrup, after Quebec. In 2011, its production represented 5.7% of the total Canadian production, while the production of Quebec represented 89.9% (FPAQ, 2012). Canada and the United States are the only two countries in the world that produce maple syrup, with Canada accounting for 82% of the world production (AAFC, 2007).

There are about 2 755 maple producers in Ontario, producing about 3.9 million litres of syrup per year from approximately 4 million taps. The regions with the highest production are Waterloo-Wellington in southern Ontario and Lanark County in eastern Ontario (survey carried out by ÉcoRessources in 2012).

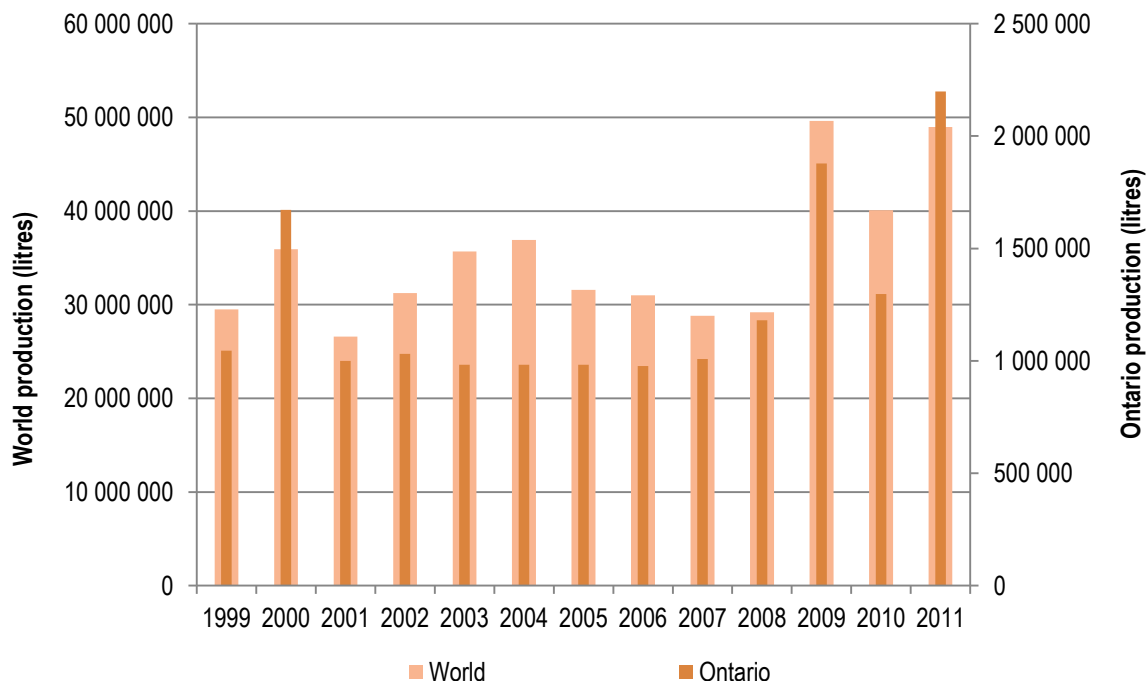
Trends in Maple Production

Production increased by about 30% between 1975 and 2008 (OMAFRA, 2009). The increase in production during this period was less significant in Ontario than it was in the whole of Canada, where maple syrup production doubled from 1990 to 2005. This difference can partially be explained by the fact that the maple syrup sectors in Quebec and New Brunswick had increasing access to public land, which was not the case in Ontario. The upward production trend for maple syrup production in Canada over the last two decades is also due to improved productivity as a result of equipment modernization and improved technical knowledge.

The maple syrup production in Ontario in 2011 is estimated at 2.2 million litres by Statistics Canada, but this number does not take into account non-registered producers. The survey undertaken during the present study estimates Ontario's production at 3.9 million litres in 2011, which is 1.7 times higher. Despite the fact that Statistics Canada underestimates total production, their data is presented in Figure 1 in order to reflect historical variations in production.

As illustrated in Figure 1, the province's maple production has shown a significant increase since 2008, from 1.2 million litres to 2.2 million litres in 2011. This increase is mostly due to investments in modernization of equipment and the improvement of production efficiency. There are reasons to believe this growth rate will not slow down in the coming years, as will be demonstrated below. Note that Ontario's production represents about 4% of the total world production.

FIGURE 1. EVOLUTION OF MAPLE SYRUP PRODUCTION IN ONTARIO AND IN THE WORLD, 1999-2011



Source: FPAQ (2012) et FPAQ (2005), compiled by ÉcoRessources.

Maple Product Prices

Maple product prices in Ontario are partially determined by market conditions in the province of Quebec, the largest producer of maple syrup in the world. The FPAQ, which is in charge of organizing the commercialization of Quebec’s maple products, negotiates prices for maple syrup according to market dynamics and quality standards. Over the last decade, the price for medium grade syrup in Ontario has gradually increased from \$2.60/lb in 2005 to \$3.11/lb in 2011 (OMSPA, 2012).

Exports and Consumption

Ontario imports more maple syrup than it exports (OMAFRA, 2009). However, exports decreased from 2 012 metric tonnes in 1997 to 846 metric tonnes in 2006, with a peak of 4 018 metric tonnes in 2002 (AAFC, 2007). As production remained constant during this period, the decrease in exports is probably due to an increase in consumption.

There is indeed a growing interest in maple syrup consumption, especially through value-added products derived from maple syrup, which include maple wine and beers, maple butter, maple candy, and cooking sauces (OMAFRA, 2009).

The per capita consumption of maple products remains low at 0.26 kg/person/year when compared with the consumption of refined white sugar. Canadians consumed 126 times more refined white sugar than maple syrup in 2005 (AAFC, 2007).

Maple Industry Stakeholders

The OMSPA is the main organization representing maple syrup producers in Ontario, with members operating about two-thirds of existing taps. Its role is to support initiatives that promote Ontario's maple producers, such as a voluntary quality assurance program, public and producer awareness and education programs, and support for applied research and marketing initiatives. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and Ministry of Natural Resources (MNR) also support these initiatives by working closely with the OMSPA and providing specific knowledge through the involvement of their crop and forestry specialists, inspection staff and conservation authorities (OMAFRA, 2009).

Changes Affecting the Future of the Maple Industry

Climate change, dietary trends and energy costs are important factors that affect the future of the maple sector in Ontario and in Canada in general. Earlier tapping dates, shorter seasons and reduced sap flows due to mid-winter thaws are all potential climate-induced changes that the maple sector has to take into account (AAFC, 2007).

Changes in the population's dietary habits also affect the demand for maple products in Ontario. Maple producers can take advantage of three current trends in consumer preferences: i) natural healthy food, ii) gourmet products, and, iii) easy-to-prepare foods. The vast variety of maple products available can satisfy one or more of these three preferences (AAFC, 2007).

Moreover, the increasing price of oil leads to increases in production costs because the production of maple syrup requires a large volume of heating oil. The maple industry is already looking for alternatives to stabilize its energy costs and to reduce its dependence on oil. It is currently working on the development of technologies that would allow a greater use of forest biomass (AAFC, 2007).

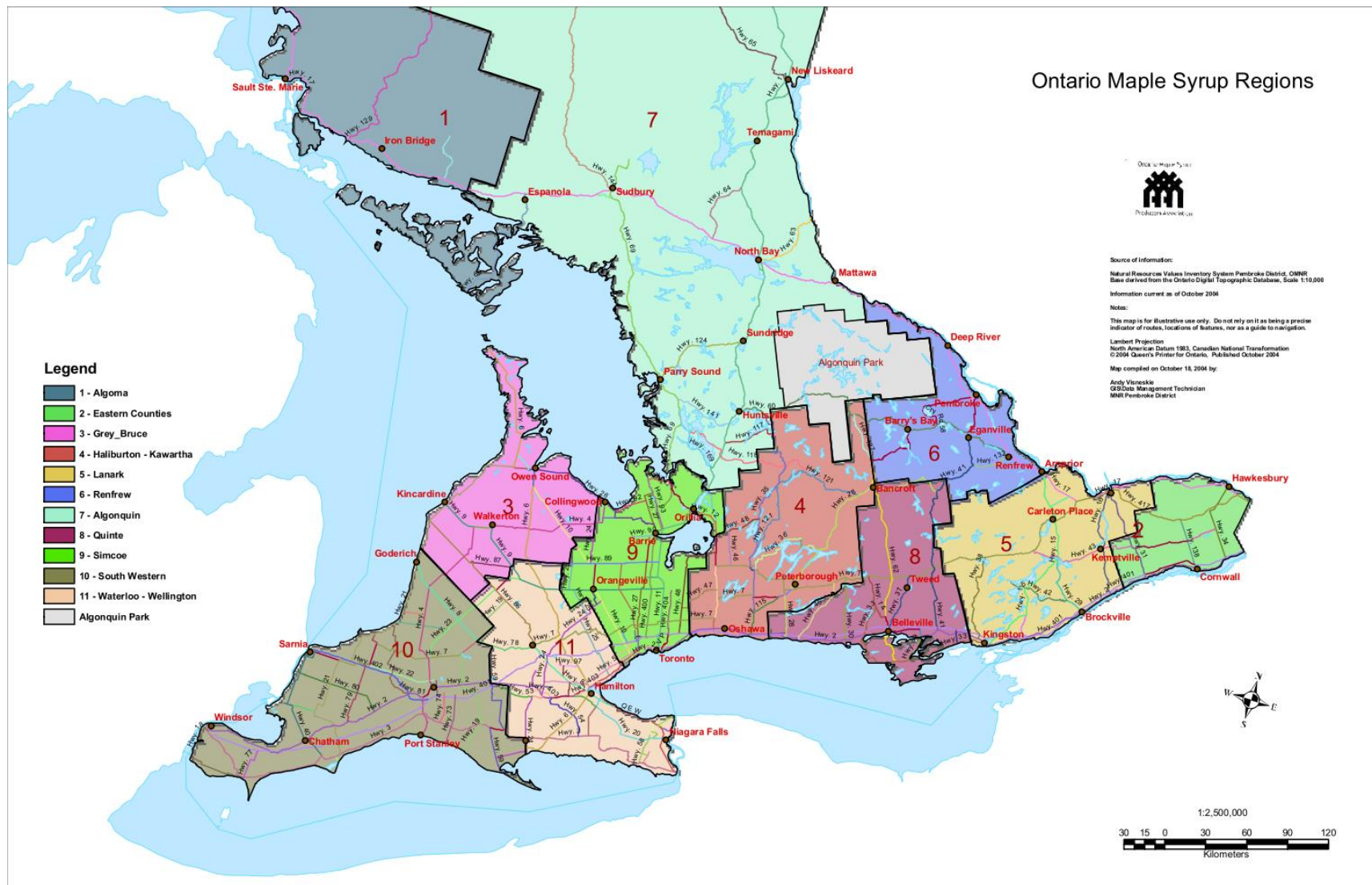
2.2 Production, processing and sales

The survey carried out as part of this study identified approximately 4 million taps presently operated in Ontario. The majority are on private land, with only 45 000 taps on public land. Therefore, 99% of the total number of taps in Ontario is found on private land, almost 1% on Crown land and less than 1% on conservation land.

The majority of maple syrup establishments are on private land and operate a maximum of 5 000 taps (around 63%). Intermediate maple bushes operating between 5 000 and 19 000 taps represent about 37% of all maple syrup establishments on private land. The number of large establishments (more than 19 000 taps) is negligible and represents less than 0.5% of the total.

For the purposes of this study, the province was divided into four major production regions. These include Eastern, Southwest, Algonquin and Algoma. The Southwest region is composed of the following four OMSPA localities: Simcoe, Waterloo - Wellington, South Western and Grey – Bruce. The Eastern region includes the following five locals: Haliburton – Kawartha, Quinte, Lanark and District, Eastern Counties and the Ottawa Valley (see Figure 2).

FIGURE 2. ONTARIO MAPLE SYRUP REGIONS



The majority of maple syrup producers are located in the Eastern region, which has more than 1 400 maple syrup operations; followed by the Southwest region with almost 900 operations; Algonquin with about 300 operations; and Algoma with almost 150 operations (see Table 1). Although the Eastern region clearly dominates in terms of the number of operations, the Southwest region follows very closely in terms of the number of taps (almost 1.4 million taps each) because of the larger average scale of its operations.

TABLE 1. MAPLE SYRUP PRODUCTION OPERATIONS AND CORRESPONDING NUMBER OF TAPS ON PRIVATE LAND, PER REGION, 2011

Region	Number of maple operations	Approximate total number of taps
Algonquin	303	845 991
Algoma	142	486 113
Southwest region	899	1 354 075
Eastern region	1 411	1 399 608
TOTAL	2 755	4 085 788

Note: 1) These numbers are estimates and should not be interpreted as exact numbers.

2) The Southwest region is composed of the following five OMSPA localities: Simcoe, Waterloo – Wellington, South Western and Grey – Bruce. The Eastern region includes Haliburton – Kawartha, Quinte, Lanark and District, Eastern Counties and the Ottawa Valley.

Source: Survey carried out by ÉcoRessources.

The OMSPA's yearly production surveys (OMSPA, 2012) demonstrate that approximately 15% of the total volume of syrup in Ontario is sold as bulk syrup, the rest being either bottled into small containers (primary processing), transformed into maple sugar, taffy or maple butter (secondary processing), or further transformed into products containing maple syrup, such as cookies, candies, pralines, and ice cream (tertiary processing). Significantly more processing is done in Ontario than in New Brunswick, where 50% of the maple syrup is sold as bulk syrup. Ontario maple syrup producers import about 20 000 litres of syrup³, mostly from Quebec, for further processing. Maple syrup and maple syrup products are also sold in pancake houses and during maple syrup festivals. According to the OMSPA, there are nine maple syrup festivals and 18 pancake houses across Ontario.

³ According to the survey carried out by ÉcoRessources.

3. Methodology and data

3.1 Methodology used

An input-output model was used to estimate the economic impacts of the maple syrup sector. This type of model is commonly used throughout Canada to calculate the benefits generated in the economy by expenditures. In this report, expenditures are represented by the expenses of the maple syrup sector, including production of bulk syrup as well as primary and secondary processing.

Before providing more detail on the models used to estimate economic impacts, some key concepts are defined below to help provide a better understanding of the results obtained.

3.1.1 *Definition of key concepts*

Direct impacts

The direct number of FTE⁴ jobs for productive sectors, such as the maple sector, is determined by the sector's employees as well as family labourers. The direct value added (i.e., the contribution of this sector to Ontario's GDP) is the overall compensation of this sector's production factors⁵.

Indirect impacts

Indirect economic impacts are those that arise from purchases of goods and services between companies. For example, maple syrup processing facilities that buy equipment generate indirect impacts (employment, GDP, taxes, etc.). Furthermore, purchases made by the equipment supplier to run its business, such as paying for fuel and insurance, are also considered indirect impacts.

Induced impacts

Induced economic impacts are generated by expenses of consumers (farmers, agricultural workers, workers in processing plants, truckers, etc.) whose jobs are made possible by expenditures in Ontario's maple syrup sector. Because consumer expenses account for more than 60% of the Canadian and Ontarian economies, it is important to estimate the induced impacts to obtain a comprehensive overview of all of the economic impacts.

⁴ Full-time equivalents are based on an average 2000-hour work year.

⁵ The compensation of production factors includes salaries and social security contributions, indirect taxes (sales and production taxes), depreciation and profits before taxes.

Total impacts: A complete picture of economic impacts

Total impacts are the sum of direct, indirect and induced impacts, calculated using the different models used in this study. These statistics give a complete picture of the economic impacts generated by the expenditures of the maple syrup sector.

3.1.2 Input-Output model

All economic impacts generated by the maple syrup sector in Ontario were estimated using the Dynatec model designed by EcoTec Consultants. Based on the latest Statistics Canada input-output data, this model was also used to break down all of the economic impacts by region. Additional information on these models is provided in Appendix 1.

3.2 Data used

Economic impacts of the maple sector were calculated based on detailed data on syrup production and processing, including transport. To perform the simulations, the set of input-output models were supplied with data on employment as well as estimations of total expenses, broken down into expenditure and revenue items. The reference year for all data and results is 2011.

Part of the information was obtained through direct sampling of businesses in Ontario. Some of these businesses granted us access to their financial and economic data while others did not. We are committed to strict confidentiality for the providers of this valuable data and can therefore not share this information, i.e., neither the nature nor the identity of the businesses that participated. Data that could lead to the identification of the participating businesses were adapted to the specific objectives of this study.

The breakdown of expenses and revenues was calculated using four sources of data:

- The OMSPA data base of active maple producers;
- The OMSPA yearly maple syrup production and pricing survey (2002 - 2012) (OMSPA, 2012);
- The Canadian Farm Business Management Council (CFBMC) report (2000) on the economics of maple syrup production. In this document, average expenses and revenues for maple syrup production enterprises are divided into six representative business sizes (500 taps, 1 000 taps, 3 000 taps, 6 000 taps, 10 000 taps, 19 000 taps and 20 000 taps). Apart from maple syrup, revenues considered in this document include gains from equipment rental and wood harvesting;
- The most recent evaluation of production costs for the Quebec maple syrup industry carried out by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ, 2005).

The data from the CFBMC report was adjusted to 2011 and used as a basis for the assessment of expenditures in maple syrup production in Ontario for different categories. This data was cross-checked and completed with adjusted data from the Quebec industry. To use this data, it was assumed that production technologies (related to the production of bulk syrup) and, therefore, expenses of the Ontario and Quebec industries are comparable. Processing expenses (packaging, kettles and equipment for primary, secondary and tertiary processing) were exclusively based on data from Ontario.

The expenditures were then differentiated into the following categories: 0 to 499 taps, 500 to 1 999 taps, 2 000 to 2 999 taps, 3 000 to 4 999 taps, 5 000 to 7 499 taps, 7 500 to 11 999 taps, 12 000 to 18 999 and more than 19 000 taps. These categories are different from the ones used for the Quebec data and were used to better reflect the reality of Ontario's sector, which generally has smaller businesses than Quebec's maple syrup sector. Finally, a survey of various Ontario stakeholders and 18 producers from different business categories in Ontario was used to fine-tune the data and to reflect the specific characteristics of the province's sector.

Subsequently, the expenditures were multiplied by the number of maple businesses in each category for each of the four regions. Associated businesses were inventoried by consulting the OMSPA active members' data base and the number of non-associated maple syrup producers per category was estimated by the executives of the 11 localities (subregions) of the OMSPA.

At times it was necessary to make adjustments to this method to increase precision or to render the data usable in this study. Details of these adjustments can be found in Appendix 2. It is important to note that the survey of the cost of production required the most adjustments because it is an accounting calculation. In fact, we are interested in activities having economic repercussions, and not in accounting procedures.

3.2.1 Pancake houses and maple festivals sector

Pancake houses and maple syrup festivals are important complementary activities of the Ontario maple syrup sector. They are based on the products issued from this sector, but must be calculated and analyzed separately because they are not completely dependent on them. One can presume that these economic activities would still exist, at least to some extent, even if Ontario did not have a maple syrup sector. For the same reason, their economic impacts cannot be added to the impacts generated by production and processing activities, but must be presented and discussed independently.

Data on pancake houses and maple syrup festivals were gathered from the OMSPA active members data list, the OMSPA web site and through two separate surveys directed to the festivals' and pancake houses' administrators. Detailed information on sales, attendance and employment were obtained for 44% (8 out of 18) of all of Ontario's pancake houses and 89% (8 out of 9) of all of Ontario's maple syrup festivals. Based on this pool of data, we constructed an average profile festival and pancake house and multiplied the expenditure data with their total number for Ontario. In the same manner as for the production and processing data, these expenses were modelled (Dynatec) in order to obtain FTEs, wealth and tax revenues generated in Ontario.

The price for maple syrup in Ontario in 2011 (i.e., the average price obtained by an Ontario producer selling bulk syrup and the average price paid by a festival or pancake house buying syrup) was considered equal to the weighted price for Ontario based on OMSPA's annual production and pricing survey (OMSPA, 2012).

3.3 A word of caution

3.3.1 Uncertainty related to the models used

It is important to remember that there is an element of uncertainty associated with the values generated by the models that were used for this study. By definition, a model is a simplified representation of reality. In the present case, regional, provincial and federal economies are modeled. The estimates of this study are the best existing estimates, but represent an approximation of actual values.

3.3.2 Induced effects

The validity of estimates of induced effects is sometimes questioned. The purpose of taking them into consideration is to have an order of magnitude of the total impact of an industry or a sector because it is widely agreed that induced effects do exist. Not estimating them because figures are uncertain would also lead to significant, and presumably greater, uncertainty. However, the following question remains: How can they be evaluated adequately?

To ensure that induced effects were not overestimated, various precautions were taken, notably:

- Several deductions were subtracted from personal income before household expenses were simulated;
- Federal and provincial income taxes were subtracted from revenues at every round of spending;
- Social security contributions (employment insurance premiums, public and private retirement plans, etc.) were subtracted from every round of spending;
- The model considers that 5% of disposable income is saved and, therefore, not spent. The average propensity to consume (APC) is thus considered to be 95%. In fact, Statistics Canada (2011) estimates the APC of Ontario households in 2010 to be 96.7%.

3.3.3 *Decisions and ad hoc assumptions*

Some decisions and assumptions made during the study may have overestimated or underestimated economic impacts. Most of them are described in detail elsewhere in this report, but for convenience they are repeated here:

- Production and processing expenses by type of enterprise are the same for the four regions;
- Profits stemming from maple syrup production in each region were obtained by distributing total provincial profits according to the proportion of expenses incurred in each region;
- Adjustments were made to some amortization expenses from the calculation of the costs of production, to better represent the reality of different sizes of maple syrup businesses;
- Even though provision was made in the cost of production for family labour, no expense was attributed to this category in the present study. This leaves the employment figures unaffected, but precludes from overestimating the induced effects;
- The distribution of revenue and expenses for production and processing activities obtained from the samples of surveyed enterprises are extrapolated for all of Ontario's industries;
- The expenditure structure per category of associated maple producers (member of the OMSPA) is equal to that of non-associated maple producers (not members of the OMSPA);
- The expenditure structure of pancake houses and maple festivals is equivalent for the whole of Ontario;
- It was assumed that production expenses for Ontario's small, intermediate, large and very large maple syrup businesses are comparable to those of Québec's small, intermediate, large and very large maple syrup businesses.

4. The economic impacts of Ontario's maple syrup sector⁶

The economic impacts of Ontario's maple syrup sector are presented in this section. This evaluation focuses on production activities, primary, secondary and tertiary processing, as well as pancake houses and festivals. The economic impacts of pancake houses and festivals are estimated separately from those of production and processing activities.

4.1 Economic impacts of Ontario's maple syrup production and processing

In 2011, Ontario's maple syrup production and processing generated a total of 1 468 FTEs in Ontario (direct, indirect and induced impacts) (see Table 2). The creation of wealth in this sector (direct, indirect and induced GDP) reached \$41 million in the province (see Table 3).

The direct economic impacts are higher than indirect and induced impacts as far as employment is concerned. They are estimated at 1 105 FTEs across Ontario, while indirect impacts are estimated at 232 FTEs and induced impacts at 131 FTEs (see Table 2). Indirect economic impacts are associated with the suppliers of the province's maple syrup production and processing sectors, such as equipment and machinery suppliers, while induced impacts are generated by the expenses of the employees of the maple syrup sector and of their suppliers.

Indirect and induced impacts on GDP exceed direct impacts. They represent \$36.7 million in Ontario, while only \$4.2 million in direct impacts were generated (see Table 3). Indirect and induced impacts on GDP are higher than direct impacts because the expenses of the maple syrup production and processing sectors are dominated by purchases from other industries, which are responsible for indirect and induced impacts, especially because these purchases are mainly made in Ontario.

Ontario's maple syrup production and processing generate wealth in all regions, but these impacts are largely concentrated in the Southwest and Eastern regions. They represent 82% of the total (direct, indirect and induced) GDP, employment and tax revenues generated in Ontario. The Eastern region ranks first among the four regions as far as job creation is concerned, with 611 direct, indirect and induced FTEs out of the total of the 1 468 FTEs generated in Ontario (see Table 2). The Southwest region, on the other hand, ranks first for the impacts on GDP, with \$22.8 million of direct, indirect and induced GDP out of the total of \$40.9 million generated in Ontario (see Table 3).

⁶ Although the results of the intersectorial models are presented with units that have not been rounded off, they do not reflect the degree of accuracy to the nearest unit. They remain estimations based on the most realistic assumptions possible.

In terms of GDP, the total impact of the Southwest region is higher than the total impact of the Eastern region (\$22.8 million compared to \$10.8 million) because salaries and profits are generally higher in the economy of the Southwest region. This difference appears despite the fact that the impact on employment is higher in the Eastern region (611 FTEs compared to 587 FTEs). The explanation lies in the fact that direct and indirect jobs are generated in higher numbers in the Southwest region than in the Eastern region. Moreover, salaries for indirect jobs created in other sectors, are generally higher than direct jobs in the maple syrup sector.

**TABLE 2. ECONOMIC IMPACTS OF ONTARIO'S MAPLE SYRUP PRODUCTION
AND PROCESSING ON EMPLOYMENT IN 2011 (FTE/YEAR)**

	Algoma	Algonquin	Eastern	Southwest	Total Ontario	Other Provinces	Total Canada
Direct	75	137	514	379	1 105	0*	1 105
Indirect	14	23	65	131	232	57	289
Induced	8	13	32	77	131	55	186
TOTAL	97	173	611	587	1 468	112	1 580

Note: Due to rounding off, some totals may differ from the sum of individual numbers shown.

*Direct impacts in other provinces are null because they represent the number of FTEs created by the Ontario maple sector only. Other provinces benefit strictly from indirect and induced impacts.

**TABLE 3. ECONOMIC IMPACTS OF ONTARIO'S MAPLE SYRUP PRODUCTION
AND PROCESSING ON GDP IN 2011 (\$/YEAR)**

	Algoma	Algonquin	Eastern	Southwest	Total Ontario	Other Provinces	Total Canada
Direct	447 712	1 002 113	1 266 918	1 506 378	4 223 121	0*	4 223 121
Indirect	1 342 186	2 137 609	6 207 518	13 148 073	22 835 386	6 969 884	29 805 270
Induced	879 918	1 370 731	3 413 144	8 217 501	13 881 294	5 371 304	19 252 598
TOTAL	2 669 816	4 510 453	10 887 580	22 871 952	40 939 801	12 341 188	53 280 989

Note: Due to rounding off, some totals may differ from the sum of individual numbers shown.

*Direct impacts in other provinces are null because they represent the GDP created by the Ontario maple sector only. Other provinces benefit strictly from indirect and induced impacts.

Other than employment and GDP, Ontario's maple syrup production also generates revenue for governments and municipalities. Taxation revenue by beneficiary is presented in Table 4. Overall, Ontario's maple syrup production and processing generated \$9 million in 2011 in taxation revenue in Ontario. The federal government benefited from \$5.5 million, the Ontario government received \$2.7 million and Ontario's municipalities \$0.8 million.

TABLE 4. TAXATION REVENUE GENERATED BY ONTARIO'S MAPLE SYRUP PRODUCTION AND PROCESSING IN 2011 (\$/YEAR)⁽¹⁾

	Algoma	Algonquin	Eastern	Southwest	Total Ontario	Other Provinces	Total Canada
Federal							
Federal income tax	79 012	128 850	314 074	720 875	1 242 811	508 996	1 751 807
GST & other indirect taxes	206 006	350 906	859 006	1 476 965	2 892 883	574 146	3 467 029
Federal tax on profits	79 232	121 642	348 533	798 142	1 347 549	519 911	1 867 460
Total federal tax revenues	364 250	601 398	1 521 613	2 995 982	5 483 243	1 603 053	7 086 296
Province							
Provincial income tax	46 715	77 387	182 902	415 775	722 779	370 784	1 093 563
PST & other indirect taxes	96 538	167 594	400 303	661 062	1 325 497	286 051	1 611 548
Provincial tax on profits	42 900	65 864	188 713	432 148	729 625	232 501	962 126
Total provincial tax revenues	186 153	310 845	771 918	1 508 985	2 777 901	889 336	3 667 237
Municipalities							
Property taxes	53 628	84 410	228 573	452 869	819 480	166 240	985 720
Total							
Total	604 031	996 653	2 522 104	4 957 836	9 080 624	2 658 629	11 739 253

Note: ⁽¹⁾ Financial aid allocated to the industry by the provincial and federal governments is not considered.

4.2 Impacts of Ontario's maple syrup festivals and pancake houses

Pancake houses and maple syrup festivals also play a significant role in Ontario's local economies. In 2011, they generated a total of 103 FTEs and \$3.4 million in GDP in Ontario (direct, indirect and induced impacts). Most of these impacts are generated by pancake houses, with 68 total FTEs and \$2.3 million of total GDP (see tables 5 and 6). As in the case of the production and processing sectors, employment direct impacts are higher than indirect and induced impacts. They are estimated at 79 FTEs across Ontario, while indirect and induced impacts are estimated at 24 FTEs (see tables 5 and 6).

On the other hand, indirect and induced GDP exceed direct impacts. They represent \$2.1 million in Ontario while direct impacts total \$1.3 million (see tables 5 and 6). As in the case of maple syrup production and processing, this is explained by the fact that expenses of pancake houses and maple syrup festivals are the result of important purchases made from other industries. These purchases are responsible for indirect and induced impacts, especially because they are mainly carried out in Ontario.

TABLE 5. ECONOMIC IMPACTS OF ONTARIO'S PANCAKE HOUSES IN ONTARIO AND IN OTHER PROVINCES, 2011

	Ontario		Other provinces	
	Employment (in FTEs)	GDP (in \$)	Employment (in FTEs)	GDP (in \$)
Direct	52	867 097	0*	0*
Indirect	6	479 598	1	145 392
Induced	10	943 355	3	258 816
TOTAL	68	2 290 050	4	404 208

Note: *Direct impacts in other provinces are null because they represent the number of FTEs or the GDP specific to the Ontario maple sector only. Other provinces benefit strictly from indirect and induced impacts.

TABLE 6. ECONOMIC IMPACTS OF ONTARIO'S MAPLE SYRUP FESTIVALS IN ONTARIO AND IN OTHER PROVINCES, 2011

	Ontario		Other provinces	
	Employment (in FTEs)	GDP (in \$)	Employment (in FTEs)	GDP (in \$)
Direct	27	445 005	0*	0*
Indirect	3	242 034	1	70 486
Induced	5	465 711	1	121 204
TOTAL	35	1 152 750	2	191 690

Note: *Direct impacts in other provinces are null because they represent the number of FTEs or the GDP specific to the Ontario maple sector only. Other provinces benefit strictly from indirect and induced impacts.

Taxation revenues generated by Ontario's pancake houses and maple syrup festivals per beneficiary are presented in tables 7 and 8. Overall, Ontario's pancake houses and maple syrup festivals generated \$0.64 million in taxation revenue in 2011. The federal government benefited from the amount of \$0.38 million, the Ontario government received \$0.19 million and Ontario's municipalities \$0.07 million.

TABLE 7. TAXATION REVENUES GENERATED BY ONTARIO'S PANCAKE HOUSES, 2011 (\$/YEAR) ⁽¹⁾

	Ontario	Other provinces
Federal		
Federal income tax	52 029	16 110
GST & other indirect taxes	152 923	18 034
Federal tax on profits	52 850	16 550
Total federal tax revenues	257 802	50 694
Province		
Provincial income tax	31 941	11 962
PST & other indirect taxes	69 257	8 656
Provincial tax on profits	28 616	7 335
Total provincial tax revenues	129 814	27 953
Municipalities		
Property taxes	45 105	6 667
Total	432 721	85 314

Note: (1) Financial aid allocated to the industry by the provincial and federal governments is not considered.

TABLE 8. TAXATION REVENUES GENERATED BY ONTARIO'S MAPLE SYRUP FESTIVALS, 2011 (\$/YEAR) ⁽¹⁾

	Ontario	Other provinces
Federal		
Federal income tax	25 932	7 657
GST & other indirect taxes	76 884	8 342
Federal tax on profits	26 301	7 894
Total federal tax revenues	129 117	23 893
Province		
Provincial income tax	15 946	5 688
PST & other indirect taxes	34 855	3 988
Provincial tax on profits	14 240	3 501
Total provincial tax revenues	65 041	13 177
Municipalities		
Property taxes	22 601	3 156
Total	216 759	40 226

Note: (1) Financial aid allocated to the industry by the provincial and federal governments is not considered.

5. Analysis

5.1 Comparison with other sectors

For comparison purposes, the economic impacts of Ontario's sugar and confectionary sector, of Ontario's food and vegetable preserving and specialty food manufacturing, and of New Brunswick's maple syrup production and processing are presented in Table 9 alongside the economic impacts of the Ontario maple syrup production and processing. Only impacts accruing within provincial borders are taken into consideration. This comparison has to be considered with due caution because it compares numbers for different years as well as industries of completely different natures.

Compared to the maple sector in New Brunswick, the economic impacts of the maple syrup production and processing in Ontario are 2.3 to 4.5 times higher. The impact on employment is 4.5 times higher (1 468 FTEs in Ontario and 324 FTEs in New Brunswick⁷), the impact on GDP is 2.3 times higher (\$40.9 million in Ontario and \$17.9 million in New Brunswick) and the impact on tax revenues is 2.6 times higher (\$9 million in Ontario and \$3.6 million in New Brunswick). Compared to other agri-food sectors in Ontario, the impacts of maple syrup production and processing are smaller than those of sugar and confectionary, and food and vegetable preserving and specialty food manufacturing.

TABLE 9. COMPARISON OF THE ECONOMIC IMPACTS WITH THOSE OF OTHER SECTORS *

	New Brunswick maple syrup production and processing*** (2011)	Ontario maple syrup production and processing (2011)	Ontario sugar and confectionary (2010)**	Ontario food and vegetable preserving and specialty food manufacturing (2010)**
Employment (in FTEs)	324	1 468	23 326	31 811
GDP	\$0.18 billion	\$0.04 billion	\$1 billion	\$2 billion
Tax revenue	\$0.036 billion	\$0.009 billion	\$0.35 billion	\$0.44 billion

Notes: * The numbers represent total impacts, including direct, indirect and induced impacts.

** AOFPP (2012).

*** EcoRessources (2012).

⁷ Impacts of maple syrup production and processing in New Brunswick were estimated by ÉcoRessources (2012) for 80% of the total maple syrup production. The numbers presented here extrapolate these results to the entire maple syrup production.

5.2 Potential for expansion

Ontario maple syrup producers have made strong gains in marketing maple syrup and syrup products. About 85% of the syrup is either bottled into small containers or further processed into derived products. This is a high percentage considering that New Brunswick's maple syrup sector bottles and processes approximately 50% of its total yearly production volume (ÉcoRessources, 2012) and Quebec's sector only does the same for 10 to 15% (ÉcoRessources, 2010). This is an indication of a developed and mature maple syrup sector that has invested time and resources to grow internally, develop markets and increase profit margins per litre of collected bulk syrup.

Untapped maple dominant stands in Ontario are relatively abundant, especially on Crown land. However, unlike Quebec, New Brunswick and several northeastern states, access to Crown land maple resources for maple syrup production is restricted. The reasons for this are not clear. The current use of Crown land for maple syrup production for the three main maple syrup producing provinces is outlined in Table 10.

As also illustrated in Table 10, Ontario has a vast potential for development of the maple syrup sector through expansion on Crown land. Whereas Quebec's and New Brunswick's industries have access to respectively 11 and 8% of sugar maple dominant forests on public land, Ontario made only 256 ha or 0.04 % available for maple syrup production in 2011. This potential for expansion can also be illustrated through the share of total maple syrup production from private land versus public land. For example, Quebec and New Brunswick both produce approximately 20% of their syrup on Crown land, while Ontario's production on Crown land is negligible.

**TABLE 10: AREAS OF MAPLE STANDS IN THREE CANADIAN PROVINCES
(OMNR, 2012; RNQ, 2002; ÉCORESSOURCES, 2012)**

	Ontario	Quebec	New Brunswick
Tappable maple stands (ha)	1 325 843	620 000	139 230
Tappable maple stands on Crown land (ha)	643 273	282 970	117 000
Maple stands on Crown land currently used for maple syrup production (2011) (ha)	256	31 706	9 239
% of tappable maple stands on Crown land currently used for maple syrup production (2011) (%)	0.04%	11%	8%

Farrell (2008) calculated that the utilization rate of sugar maple dominant forest in the state of Vermont, which has a maple sector similar to that of Ontario, is about 2%. This allows us to estimate that approximately 13 000 additional ha could be tapped on Ontario's Crown land, which implies 1.8 million additional taps.

This study did not analyze current use of Crown land maple dominant stands, nor the allocation mechanisms and policies in place. Thus, we cannot draw conclusions on the current and future availability of these forest resources in Ontario.

6. Conclusion

This study estimates the direct, indirect and induced economic impacts generated by Ontario's maple syrup sector, namely maple syrup production and processing, pancake houses and maple syrup festivals. The results of this analysis lead to a better understanding of the importance of the maple syrup sector for local economies.

Ontario's maple syrup production and processing creates wealth in all regions, but especially in the Eastern and Southwest regions. Their total economic impacts are estimated to be 1 468 FTEs and \$41 million in GDP in 2011 across Ontario. Moreover, pancake houses and maple syrup festivals also play an important economic role in local economies. The maple syrup sector is a developed and mature industry that has an important potential for expansion. However, despite the abundance of untapped maple stands on Crown land, access for maple syrup production is restricted. The reasons for this are not clear.

The results of this study also show that the volume of maple syrup production has been underestimated in Ontario. The survey undertaken during this study estimates production in 2011 to be 3.9 million litres, which is 1.7 times higher than the 2011 production estimated by Statistics Canada (2.2 million litres). The latter does not take into account producers who are not members of the OMSPA.

References

- Agriculture and Agri-Food Canada (AAFC). (2007). Canadian Maple Products. Situation and Trends 2006-2007. On-line: http://www4.agr.gc.ca/resources/prod/doc/misb/hort/sit/pdf/maple_2006-07_e.pdf
- Alliance of Ontario Food Processors (AOFP). (2012). Economic Impact Analysis: Ontario Food and Beverage Processing Sector. Prepared by MNP LLP. On-line : <http://www.aofp.ca/Uploads/File/mnp-economic-report-2.pdf>
- Canadian Farm Business Management Council (CFBMC). (2000). Report on the economics of maple syrup production. Produced by the Canadian farm business council and the Ontario ministry of agriculture, food and rural affairs.
- ÉcoRessources. (2010). Les retombées économiques de l'industrie acéricole au Québec et au Canada. ÉcoRessources Consultants for the Fédération des producteurs acéricoles du Québec.
- ÉcoRessources. (2012). Economic Impacts and Comparative Analysis of the Maple Industries on Crown Land in New Brunswick. Prepared for the New Brunswick Department of Natural Resources.
- Farrell M. (2008). Growth potential in the Northern New York Maple Industry. Cornell maple program.
- FPAQ [Fédération des producteurs acéricoles du Québec]. (2012). Dossier économique 2012. Online: <http://www.siroperable.ca/AxisDocument.aspx?id=1697&langue=fr&download=true>
- FPAQ [Fédération des producteurs acéricoles du Québec]. (2005). Dossier économique 2005. Online: <http://www.siroperable.ca/AxisDocument.aspx?id=70&langue=fr&download=true>
- MAPAQ [Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec]. (2005). Étude sur le coût de production du sirop d'érable (vrac) au Québec en 2003. Direction des politiques sur la gestion des risques.
- Ontario Ministry of Natural Resources (OMNR). (2012). Data bases of Hard and Soft Maple Working Group Summaries.
- OMSPA. (2012). Ontario maple survey production and pricing survey results. Yearly report based on internal survey of the Ontario maple syrup producers' association.
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). (2009). Maple Syrup. On-line: http://www.omafra.gov.on.ca/english/crops/facts/info_maple_syrup.htm#orchards
- Ressources naturelles du Québec. (2002). Revue Forêt, No 75. Du nouveau sur les érablières sur les domaines de l'État.
- Statistics Canada. (2011). Provincial and Territorial Economic Accounts: Data Tables, catalogue number 13-018-X.

Appendices

Appendix 1. Detailed description of the economic impact models used

Dynatec Model

The Dynatec model developed by EcoTec Consultants to determine economic impacts is dynamic and based on sets of input-output tables completed by econometric modules. More complete statistics on economic impacts are generated by using these modules.

The model is divided into two principal modules: i) the calculation of economic impacts by province and, ii) the calculation of economic impacts by county in the province of Ontario.

Interprovincial model

The simulation of a “shock” in the Ontario economy begins with the introduction of a vector of expenditures into the model, i.e., either both sectors’ expenses for goods and services, or the estimated costs of the processing facilities. The main algorithm begins with the calculation of margins (indirect taxes on production, retail and wholesale business margins, transportation, etc.) and imports from other countries as well as from each of the nine other Canadian provinces, from which these imports are subtracted from the vector of expenditures. Thus, the sum remaining in the model is the amount that will in fact remain in Ontario's economy for this first round of expenses.

The model thus determines the industries that will produce the goods consumed initially (vector of initial expenditures). For example, if the initial expenses include \$5 million for tubing, this amount will mostly be found in the specialized plastic manufacturing industry.

The model extracts the GDP component (value-added) from industry sales data. Finally, government taxation revenue is calculated for three main categories of returns: personal income tax, indirect taxes (sales tax, excise taxes, etc.) and income tax on the profits of enterprises.

The second round of expenses will be purchases by the enterprises to meet initial demand. For example, to supply maple syrup producers with barrels, manufacturers buy raw materials, electricity, etc. For the third round of expenses, manufacturers will make purchases from their suppliers. With each round of spending, the amount of money that remains in the economy diminishes due to three significant types of leaks: imports of goods and services from other countries and from the nine other Canadian provinces; taxes levied by governments; and savings by households and enterprises (retained earnings and amortization). Since this is a dynamic model, economic impacts are calculated over a maximum of 15 years after initial spending.

The model is also interprovincial in nature. At each round of spending, purchases made by other provinces from Ontario enterprises are entered into the “Ontario” part of the model. This permits a more precise calculation of true economic impacts because Ontario enterprises are suppliers to various industries located in different provinces.

The model makes various adjustments to ensure that induced impacts are not overestimated, such as:

- Federal and Ontario personal income taxes are both deducted before households spend their salaries;
- Social contributions are deducted from the workers' salaries (employment insurance premiums, public and private pension plans, etc.);
- A rate of 95% is used for the APC (the remaining 5% is considered to be household savings). In fact, Statistics Canada (2011) estimates the APC of Ontario households in 2010 to be 96.7%.

Regional model

Two models function simultaneously in the regional model, simulating the actual functioning of the Canadian economy (interprovincial model) as well as Ontario's economy (regional model). The regional model calculates the same statistics as the interprovincial model, but at the county level.

Appendix 2. Assumptions and adjustments to maple syrup production statistics

Time worked and salaries

Even though the cost of production allows for paid family labour, no expense is attributed to this item in the present study. To include it in the context of an evaluation of economic impacts would have been erroneous because no sum of money is actually transferred and thus no sum of money can be spent again and so on. Its inclusion would have led to an overestimation of the induced effects of maple syrup production. This will not in any way affect maple syrup production revenue, but rather only the breakdown of expenditures.

Expenses and profits

Production expenses by type of enterprise were considered to be the same in all Ontario counties; in other words, no adjustments in the cost of production were made to take regional particularities into account. However, expenditure data also had to be indexed because they were based on 2003 prices. To do so, the consumer price index published by the Institut de la statistique du Québec⁸ and data on 2011 fuel prices were used.

Data on the number of enterprises per stratum and per county allowed us to distribute estimated expenditures in each Ontario region. However, it was only possible to estimate profits at the provincial level by multiplying the total production by the weighted price of maple syrup, and then subtracting total expenditures from this amount. It was then necessary to divide this global figure by distributing total profits between counties in the same proportion as expenses.

Cost of production also includes amortization expenses. Given that it was the only estimation that we had to quantify the investments made in maple syrup enterprises, we chose to take it into consideration. However, as is the case for family labour wages, the use of an intersectorial model requires adjustments in the calculation of production costs. Thus, modified amortization was added to the expense structure to better reflect reality. We first created six categories of amortization because the cost of production report enabled us to do so. Then, we varied the percentage of three of the categories as a function of the type of amortization and the size of the farms. This process is detailed in Table 11.

⁸ Institut de la statistique du Québec (2011). Principaux indicateurs économiques conjoncturels : indice annuel des prix à la consommation. Online: http://www.stat.gouv.qc.ca/princ_indic/ipcgouva.htm

TABLE 11. ADJUSTMENT OF AMORTIZATION FOR THE MODEL

Amortization category	Original amount	Rate applied according to the type of enterprise				Amount entered in the model
		Small	Medium	Large	Very large	
Amortization of motor vehicles (tractor, truck, snowmobile, skidder)	\$1 057 901	100%	100%	100%	100%	\$1 057 901
Amortization of tubing and pipes	\$800 207	110%	110%	110%	110%	\$880 228
Amortization of specialized equipment (pumps, reverse osmosis machines, evaporators, filter presses, barrels, washers)	\$765 529	100%	100%	100%	100%	\$765 529
Amortization of other equipment (wood equipment, snow blowers, pressure washers, saws, tanks, small tools, computers)	\$110 033	30%	30%	30%	30%	\$33 010
Amortization of buildings	\$186 841	100%	100%	100%	100%	\$186 841
Amortization of vehicles and lawn tractors	\$11 667	0%	0%	0%	0%	\$0

The objective of the adjustments in some amortization categories is to better represent opportunity costs of Ontario enterprises. A decrease was applied to the categories “other equipment” and “vehicles and lawn tractors” because some of this equipment is not used exclusively for maple syrup production. It was assumed that maple production owners invest in such equipment for reasons largely unrelated to maple syrup production and, therefore, only a percentage of the expenses related to these investments should be entered in the model.

All of these adjustments are done within the parameters that already exist for revenues and expenses. The impact of these adjustments is simply to distribute these sums differently and to better reflect actual cash flows.