
Summary sheet

THE QUEBEC INPUT-OUTPUT MODEL

Abstract

The Quebec input-output model (in French, *Modèle intersectoriel du Québec – MISQ*) developed by the Institut de la statistique du Québec (ISQ) measures the magnitude and distribution of the economic impact of an investment (also known as a “shock”), whether it is related to production or consumption.

The model makes it possible to simulate and quantify the effects of certain real, anticipated or hypothetical changes in the Quebec economy. It makes it possible to estimate, among other things, the added value, employment and imports required to respond to an investment (linked to the offer or the demand) in the Quebec economy. The model makes it possible not only to estimate these effects but also to study how they propagate in the supply chain, both in the sector directly impacted and among their suppliers.

History

The first advances in modelling an economy on the basis of input-output tables were made by Wassily Leontief in the 1940s and 1950s. These ideas were taken up in Quebec in the 1960s by Tadek Matuszewski, then professor at Université Laval. It was under his direction that “work was done to develop an economic accounting system that would make it possible to estimate the economic impact of various projects on the Quebec economy” (Gagnon & Nguyen, 2016, p. 3), a system now known as the *Modèle intersectoriel du Québec*.

Since then, the model has been used to quantify the real, anticipated or hypothetical effects of an economic activity.



Method

The MISQ is a model of demand propagation. It simulates how an “exogenous shock,” in other words, any expenditure in a defined sector, will be diffused in the Quebec economy. The direct effects are those concerning the sector directly affected by the initial expenditure. Indirect effects concern the effects for the suppliers of the affected sector, the suppliers of those suppliers, and so on, until the sum of the indirect effects is obtained. This makes it possible, in short, to evaluate “the impact on labour, value added, imports and other production [and] to estimate government revenues in the form of taxes and parafiscal charges paid by salaried workers” (Gagnon & Nguyen, 2016, p. 25). The data for these simulations comes from Statistics Canada’s National Accounts. This allows the ISQ to subdivide the Quebec economy into 447 categories of goods and services, 184 productive sectors, 62 productive sub-sectors and 244 final demand sectors (Gagnon & Nguyen, 2016, p. 16). It is the average spending structure of each of these subsets that serves as the basis for the estimates.

Example of economic impact for governments

For the government of Quebec	Thousands of \$
Wage taxes	1 940 \$
Sales taxes	1 146 \$
Specific taxes	263 \$
Other Quebec-related charges (RRQ, FSS, CSST, RQAP)	10 478 \$
TOTAL	13 827 \$

For the government of Canada	Thousands of \$
Wage taxes	297 \$
Sales taxes	546 \$
Excise taxes and duties	33 \$
Other Canada-related charges (Employment Insurance)	2 460 \$
TOTAL	3 337 \$

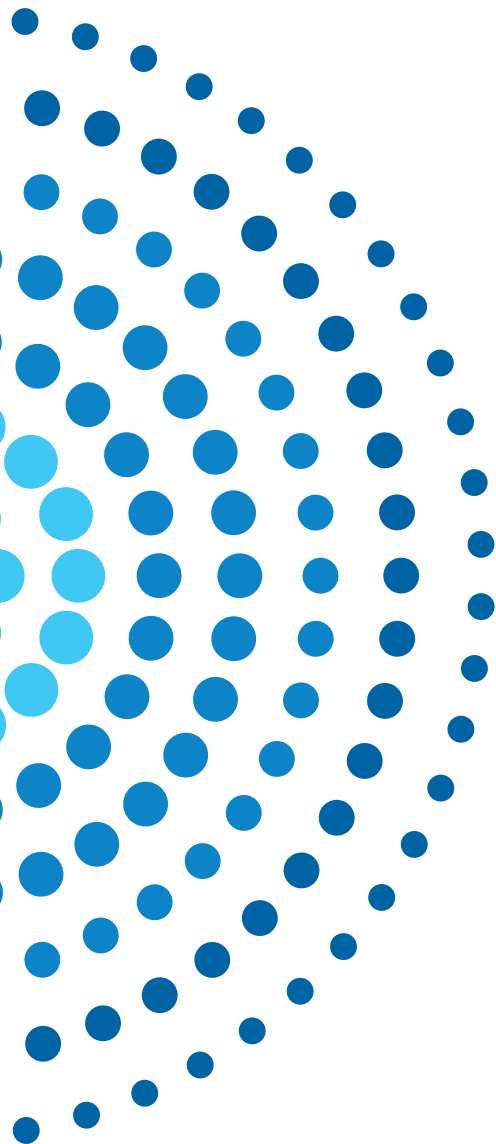
Drawn from the study by Delorme, 2015, p. 18 (our translation).

Scope and limitations

This analytical tool is useful for understanding the magnitude and distribution of the economic impact of an investment (also referred to as a “shock,” regardless of whether it is related to production or consumption). It quantifies the economic impact on the rest of the economy.

However, it is important to remain cautious when using the model because, as the authors of the user’s guide state, “a rigorous economic impact analysis requires not only a good knowledge of how the model works, but also the ability to interpret the results obtained in light of the limitations and assumptions inherent to the model” (Gagnon & Nguyen, 2016, p. 38). Here are some technical limitations that should be kept in mind:

- **Impacts are calculated as if they were all realized in the same year, the year of the simulation.** This constraint is less of an issue when calculating the impact for a recurring activity, as opposed to a non-recurring activity, especially if it is a large capital expenditure over several years. Updating the model each year to reflect the current tax structure can be distorting. This is because the tax impacts calculated for the year of the simulation will be different from the actual tax impacts, if they materialize at a later date, because the tax structure will have changed in the meantime.
- **The model is linear.** The effects resulting from the modelling of a very large investment may not take into account the limited capacity of certain sectors to respond to new demand, the volume of imports and the price increases that this new demand could cause, and the investments that would be made in the long term to adjust to this new demand.
- **The estimates are only available for the whole province of Quebec; they do not allow for a regionalized analysis** (Gagnon & Nguyen, 2016, p. 38).



Uses

The ISO's economic statistics department is responsible for maintaining and supporting the use of the model.

The MISQ is used quite frequently in the social economy sector. For example, a study conducted for the Collectif des entreprises d'insertion du Québec (Comeau, 2011), updated by Delorme (2015), bases an entire section on this model. This makes it possible to produce findings such as the following:

Operating expenses of \$95.2 million related to the operations of work insertion enterprises that are members of the CEIQ in 2013 support 2,724 person-years for a payroll of \$61.8 million. This means that, through their actions, CEIQ members are directly responsible for the creation of 170 permanent and full-time jobs among their suppliers (Delorme, 2015, p. 21).

Many other organizations use the MISQ to qualify their economic impact in terms of jobs and added value. Examples include Bâtir son quartier (2016, pp. 24-25), the Fonds de solidarité FTQ (2016, p. 6) and the Fédération des coopératives de développement régional du Québec (MCE Conseils, 2014, pp. 19-20).

There is also a Canadian national and interprovincial input-output economic impact model, operated by Statistics Canada (2016). While the latter has slight differences (for example, it incorporates certain elements relating to the environment but does not go as far in terms of fiscal impacts), it has essentially the same advantages and limitations as the MISQ.

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Contributions

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